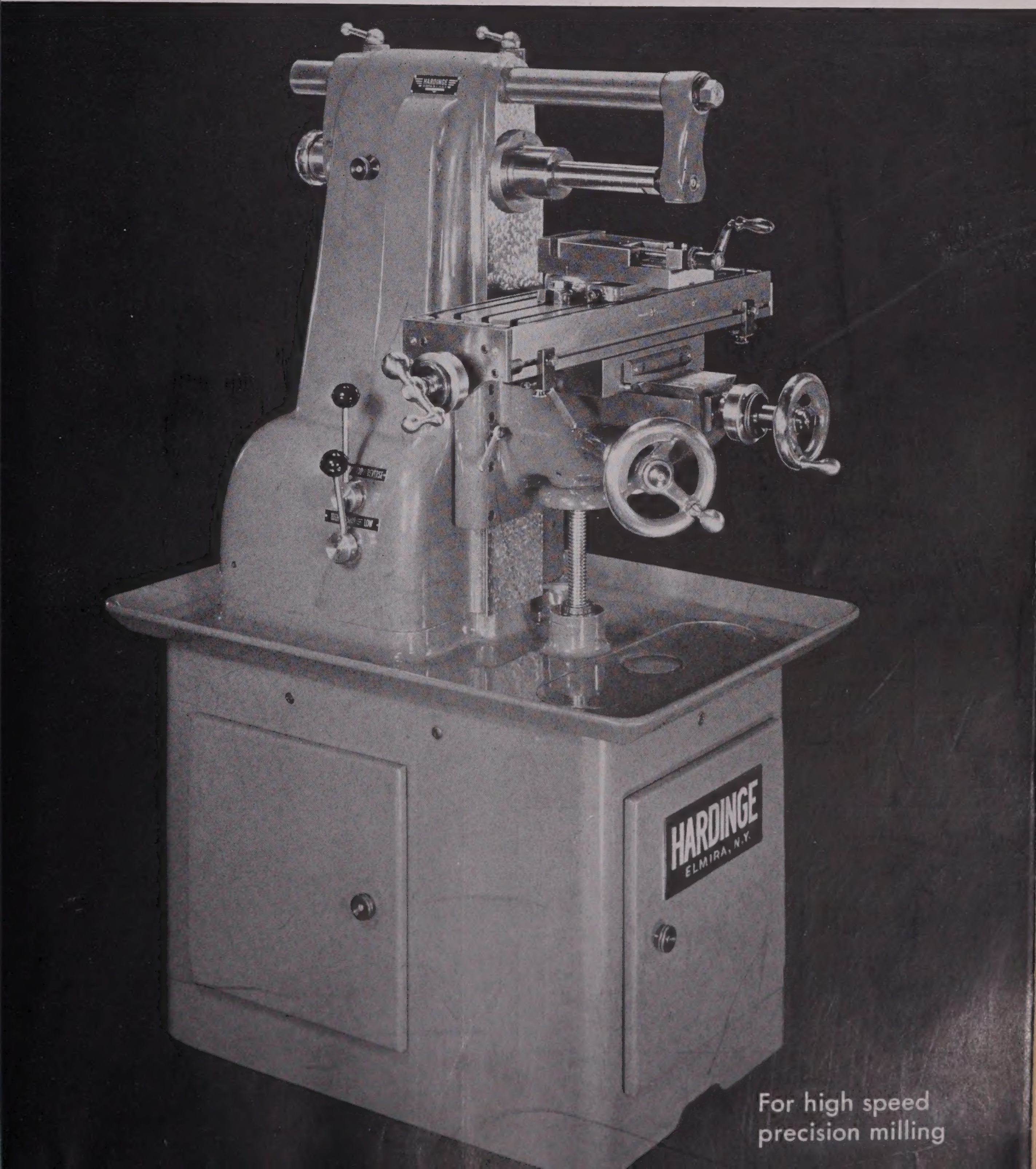
ents—p. 41
ng Repairs—p. 46
Block Accessories—p. 52
Mold Samples—p. 57
bination Plating—p. 60
trial Briefs—p. 92
trial News Summary—p. 93
parison of Prices—p. 124

Illinois U Library

The IRON AGE

DECEMBER 23, 1948


HARDINGE
HARDINGE
ELMIRA, N.Y.

For high speed precision milling

It's like shoveling snow with a pitchfork

The wrong equipment never does a satisfactory job of handling materials, on the sidewalk or in the shop. That is why we urge you to check your materials-handling methods *now.* Inadequate or cumbersome equipment is adding millions to America's production costs!

Overhead Traveling Cranes are economical material movers . . . transporting their loads without aisles or floor maintenance. Whiting builds cranes to meet the needs of the individual plant—with capacities, speeds, and construction engineered to match their respective tasks. The result is over-all efficiency and economy of operation that give Whiting Cranes top rank among industrial users.

It will pay you to call in a Whiting representative to discuss your materials-handling methods. Whiting Corporation, 15601 Lathrop Ave., Harvey, Illinois.

IMPORTANT

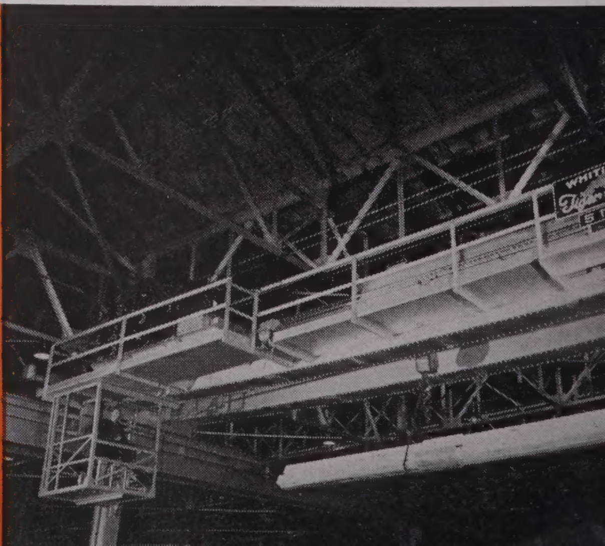
Whiting has acquired the patents, manufacturing, and sales rights to Spencer & Morris Tramrail Systems. These, combined with Whiting Hoists, Light Cranes, and Heavy Cranes, enable Whiting to supply a complete, fully integrated overhead materials-handling system.

WHITING CORPORATION
15601 Lathrop Ave. Harvey, Illinois

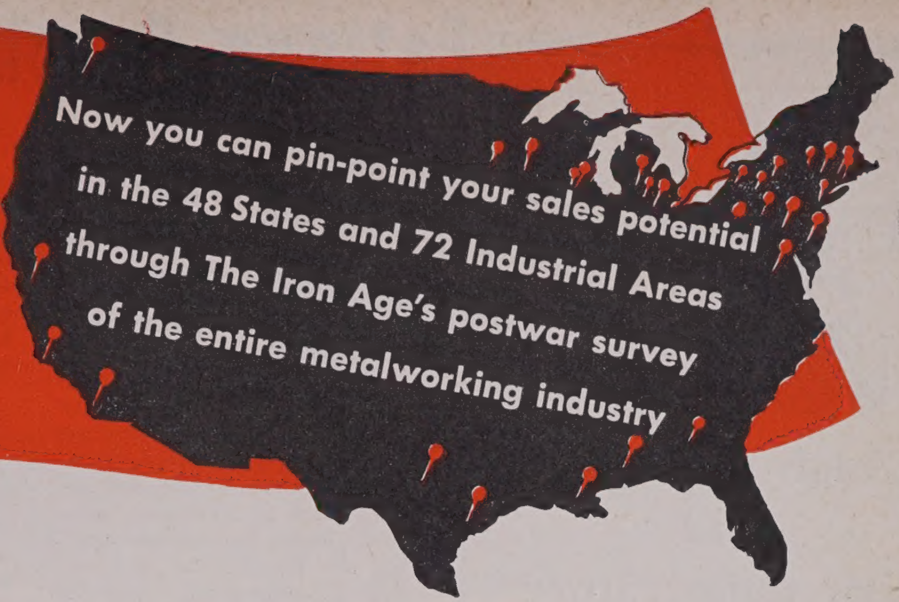
Offices in Chicago, Cincinnati, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, and St. Louis. Agents in other principal cities. Canadian Subsidiary: Whiting Corporation (Canada) Ltd., Toronto, Ontario. Export Department: 30 Church St., New York 7, N. Y.

Dependable ·· Quiet-Running ·· Durable
WHITING
Overhead Traveling **CRANES**

BUILDERS OF QUALITY CRANES
FOR OVER 60 YEARS



in Chicago?
Detroit?
Cleveland?


Now you can pin-point your sales potential
in the 48 States and 72 Industrial Areas
through The Iron Age's postwar survey
of the entire metalworking industry

If you sell products to any branch of the giant metalworking industry, The Iron Age now offers a basic new tool that makes it possible to set quotas, plan sales territories, determine market potentials more quickly, easily and accurately than ever before.

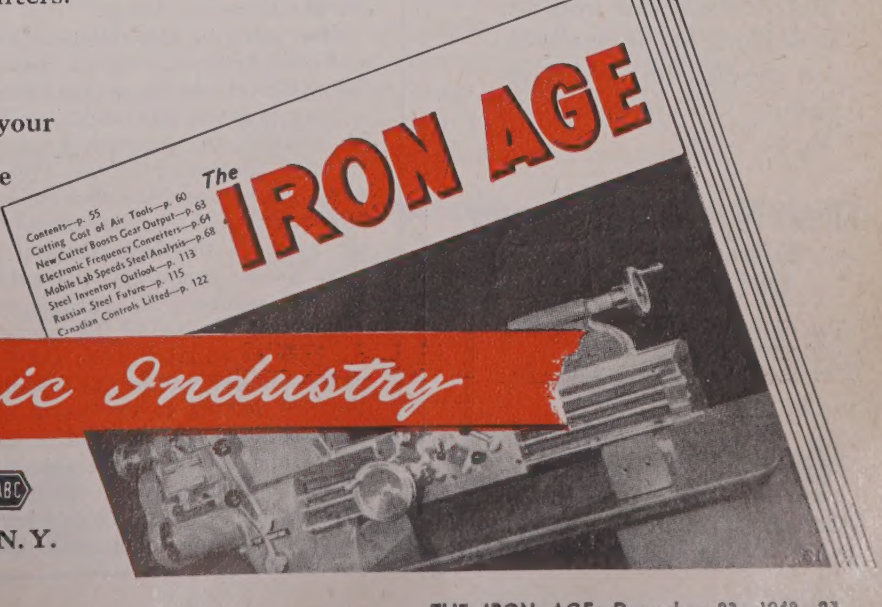
Through an intensive survey covering every field of metalworking, detailed, up-to-date, postwar statistics have been collected on 95% of all plants employing 21 or more production workers.

Printed summaries giving plant breakdowns by size and classification are now available for the nation as a whole, for each state, and for the 72 major metalworking centers.

In each case, all information is keyed to plant-by-plant manpower. For workers are the best gauge of how much any plant can consume in materials, tools and supplies. In modern research, they have become the accepted and by far the most reliable index for market projections.

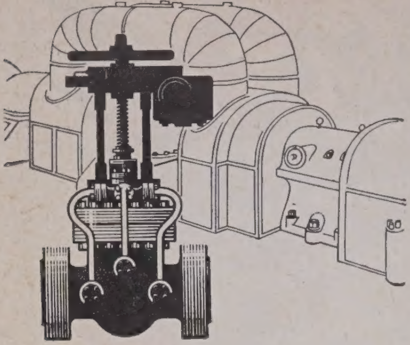
In addition, carefully worked out formulas have been developed so that you can relate this wealth of basic data to your own specific problems. If needed, too, we'll be glad to tell you how this basic information may be applied to your specific sales problems.

For complete information, call your nearest Iron Age representative or write direct.


The IRON AGE
Contents—p. 55
Cutting Cost of Air Tools—p. 60
New Cutter Boosts Gear Output—p. 63
Electronic Frequency Converters—p. 64
Mobile Lab Speeds Steel Analysis—p. 68
Steel Inventory Outlook—p. 113
Russian Steel Future—p. 115
Canadian Controls Lifted—p. 122

. . in a basic Industry

A Chilton Publication
100 East 42nd St., New York 17, N. Y.



high pressure and high temperature

Not so many years ago, designers shunned gray iron for high pressure and high temperature usage. This is all changed — such castings are now freely specified.

Molybdenum has made possible this type, and many other types, of high quality cast iron.

Some high pressure steam valves are made of cast iron containing 3.10% Total Carbon, 2.45% Silicon, 0.75% Manganese with 0.75% Molybdenum added. This composition, and hundreds of other examples of the economical application of Molybdenum cast iron, are to be found in our new booklet, "Applications of Molybdenum Cast Irons". Write for it!

Climax Molybdenum Company
500 Fifth Avenue
New York City

Please send your FREE BOOKLET
"Applications of
Molybdenum Cast Irons"

Name..............................

Company..............................

Address..............................

IA. 12 F 10

Fatigue Cracks

BY C. T. POST

Nuts

• • The tribulations of a newshound in the nation's capital properly are a subject for pity. Bow your head and shed a tear for Eugene J. Hardy who spies (in a nice sense of the word) for your favorite family journal's Washington bureau. Gene must keep his ear to the ground and his shoulder to the wheel, as the Senators like to say. When the teletype buzzes he must be prepared to state unequivocally what the prospects are for legislation on allocations, price control, basing points, anti-trust suits, the Taft-Hartley law, accelerated depreciation; war in China; peace at Lake Success; manganese in East Africa; or President Truman's breakfast. It's enough to drive a man nuts, even if he's Hardy.

So it was that when our Mr. H. opened his daily ration of advertising circulars the other day he felt an aptronymic resonance for one brochure in particular. The come-one was a drawing of an obviously ecstatic squirrel with the caption, "He's dreaming of a day at Hardy's Nut House." Hardy's Nut House, the circular went on to say, was a Mississippi pecan firm, but Gene is thinking of posting a similar tag on his National Press Bldg. hangout.

Legislative Love

• • Foreign news is pretty confused at best these days. To try to straighten out in our own mind some of the goings-on in exotic lands across the globe we mentally translate them in terms of American places, people, things.

After applying this technique to a *Herald-Tribune* dispatch from Tokyo, though, we can see the habit is going to get us into trouble. Said the dispatch, the Japanese finance minister (Secretary of the Treasury) was host at a drinking (cocktail) party in the finance committee room of the Diet (capitol). Mrs. Harue Yamashita, the only woman member of Parliament (Congress) was one of the guests. An hour or so later, when the finance minister was due to present the new budget to the house of representatives Mrs. Yamashita found him asleep on the sofa in one of the lobbies. When she tried to rouse him, she said he told her, "I don't care anything about the budget. I love you."

When she expostulated, she said, the finance minister threw his arms around her and said something like: "With me, you come a long way before the budget." In the struggle which followed, Mrs. Yamashita said, she slapped the finance minister's face and the finance minister bit her.

Try as we will, we can't visualize the incident with Secretary of the Treasury Snyder and Rep. Chase Going Woodhouse (the lady's name fascinates us) taking the parts. Worse yet, some impish whim in our subconscious seems to whisper, "Try to think of Sec. Morgenthau and Frances Perkins." We know darn well THAT scene wouldn't ring true from any standpoint.

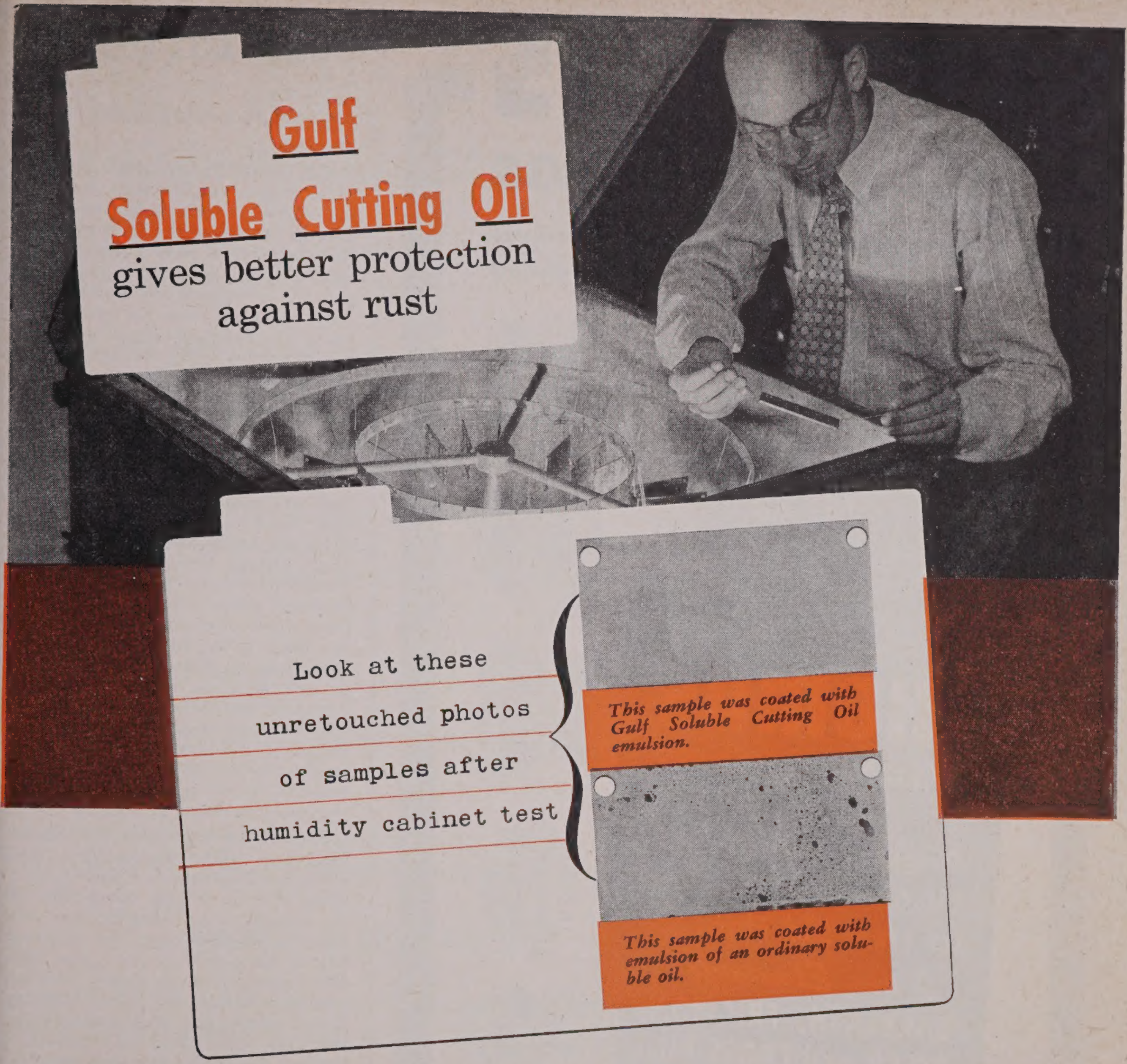
Love That Admiral

• • By natural inclination, your favorite family journal likes to work in its shirt sleeves in summer, wear carpet slippers in winter if the Bull of the Woods will allow it. Somehow the mysteries of automatic transfer machines, fatigue failures, and inter-action of metals seem much clearer when you can thrust your shoulders or wiggle your fourth toe.

But, lest there be any misunderstanding, your f.f.j. also can be right at home with sack-suited moguls of industry or the military brass and braid. Just the other day Rear Admiral Frank Baldwin, representing the procurement and cost accounting organizations of the Army-Navy-Air Force was holding a press conference on new regulations regarding advertising cost allowances on military contracts. The admiral said that advertising costs on most types of contracts are to be allowed only on product advertising, sale of scrap and help wanted ads placed in technical and trade journals. Then someone said, "How about a full page ad in The Iron Age, for example"

"Certainly," the admiral is reported to have said. "The Iron Age is the bible of the trade and has been since I've known anything about it."

We suppose, although no one said so, that this orchid is the admiral's personal view and not an official opinion of the Army, Navy, and Air Force.



Gulf Soluble Cutting Oil gives better protection against rust

Look at these unretouched photos of samples after humidity cabinet test

This sample was coated with Gulf Soluble Cutting Oil emulsion.

This sample was coated with emulsion of an ordinary soluble oil.

Here's protection for metal parts being machined in your shop! The excellent rust preventive properties of Gulf Soluble Cutting Oil prevent rust formation between processes or when the job is left on the machine. It keeps highly finished surfaces bright longer!

The two samples shown above tell the story! Both have been exposed to a controlled flow of 120°F. air saturated with water (Relative Humidity—100%) for a period of more than two hours.

Note the startling difference! The sample coated with an emulsion of Gulf Soluble Cutting Oil shows no signs of rust formation even at the plate corners, which are more difficult to protect. The sample coated with an ordinary soluble oil emulsion is spotted with rust marks, many of which have marred the surface permanently.

This is another important plus value of Gulf Soluble Cutting Oil. For further information write, wire, or phone your nearest Gulf office.

GULF INDUSTRIAL LUBRICATION

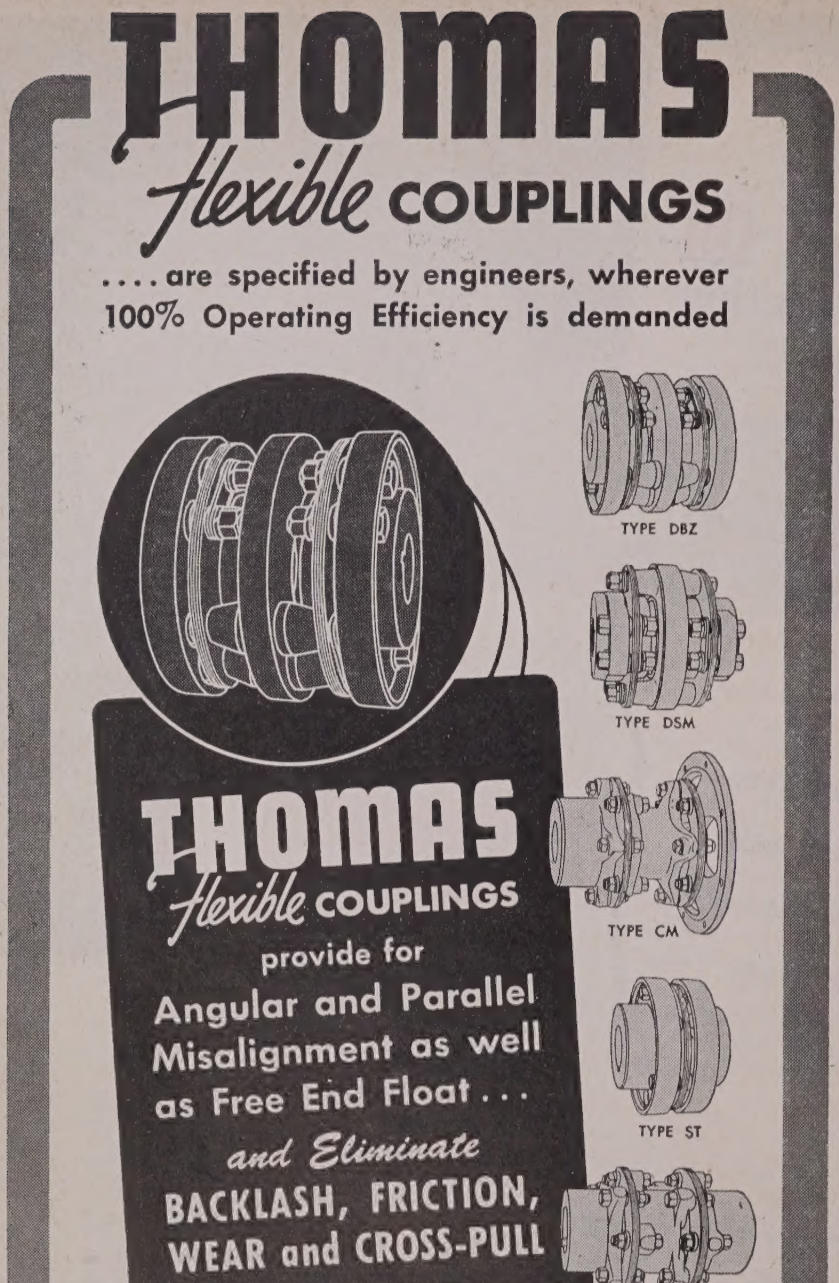
Gulf Oil Corporation · Gulf Refining Company

Division Sales Offices:
Boston · New York · Philadelphia · Pittsburgh · Atlanta
New Orleans · Houston · Louisville · Toledo

Gulf Oil Corporation · Gulf Refining Company IA
3800 Gulf Building, Pittsburgh 30, Pa.
Please send me, without obligation, the material I have indicated below:

☐ Further information on Gulf Soluble Cutting Oil.
☐ Practical slide-rule-type calculator for help in maintaining desired soluble oil concentrations.

Name...
Company...
Title...
Address...


THOMAS
Flexible **COUPLINGS**
....are specified by engineers, wherever 100% Operating Efficiency is demanded

THOMAS *Flexible* **COUPLINGS** provide for Angular and Parallel Misalignment as well as Free End Float... *and Eliminate* **BACKLASH, FRICTION, WEAR and CROSS-PULL**
NO LUBRICATION IS REQUIRED!

TYPE DBZ
TYPE DSM
TYPE CM
TYPE ST
TYPE AM
TYPE SS
TYPE DBZ-D
HIGH SPEED HEAVY DUTY FLOATING SHAFT TYPE FLEXIBLE COUPLING

The Thomas All-Metal Coupling does not depend on springs, gears, rubber or grids to drive. All power is transmitted by direct pull.

WRITE FOR COMPLETE ENGINEERING CATALOG

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

Dear Editor:

DISCOVERY OF STAINLESS

Sir:

The article by Dr. Carl Zapffe on "Who Discovered Stainless Steels" in the October 14 issue makes interesting reading in view of the facts he brings forth regarding early workers in the field. To my mind, the question he raises is not unique to stainless steels. As a matter of fact, his question involves the basic consideration of who should receive credit for any successful discovery. The general question might be stated: Who deserves the greater credit—the man who first made the alloys and possibly studied some of their properties, thereupon relegating them to obscurity, or the man who made the alloys, recognized their value to society, and proceeded to convince everyone of the usefulness of the alloys? Brearley, Strauss, and Mauer were in the latter group. They produced alloys that admittedly were in the hands of previous investigators; but, what is important, went far beyond them in persuading both industry and the public that the chromium-iron and the chromium-nickel-iron alloys of the stainless variety were useful. The alloys, they claimed, deserved consideration in view of their potential value in many applications requiring corrosion resistance.

At this vantage point in history, the job of selling the stainless steels to the metal industry sounds like something akin to selling automobiles in the postwar era. Actually, the very opposite was the case. To whatever extent the public at that time may have been ready to accept stainless steels, certainly the steel industry moved slowly and unenthusiastically. One finds opportunity for reflection in reading Harry Brearley's account of repeated attempts to convince his employer that stainless steels really had a future. Whatever the difficulties he had in making and testing the chromium-iron alloys, they were minor compared with his efforts at salesmanship.

Nevertheless, it was largely because of his continued persistence in producing and heat-treating stainless steels having suitable properties for the application that brought eventual honor and credit. It makes less difference, practically, that there were several investigators previous to him who had prepared the chromium-iron alloys. Maybe Brearley was influenced in some way by their work, but they had none of the same spark of inspiration and certainty of purpose. Still, credit in some measure is due the men who bordered the fringe of invention, and Dr. Zapffe in this regard has rendered a service by bringing their names again to the fore so that we may ex-

SINCE 1846
BAIRD HIGH PRODUCTION MACHINES

- For producing articles made of wire, ribbon metal, castings, forgings or cut off bar stock.

- BAIRD 76H Chucker is an Automatic 7″ Six Spindle, Indexing, Horizontal Lathe with different speeds available at the work spindles for different operations in the one handling of a piece and with other time saving features.

- BAIRD 54VC Lathe is an Automatic 5″ Four Spindle, Vertical Continuous Machine for many light or finishing cuts on parts, as facing ends or chamfering grooves on pistons, etc.

- BAIRD 12-Station Duplex Turning Machine is for such as turning the four trunnions on the "spider" or journals for universal joints and boring and facing the yokes of such joints.

- BAIRD Multiple Transfer Presses for multiple operation in one handling on articles made from ribbon metal.

BAIRD ALSO MAKES

- BAIRD Four Slide Wire and Ribbon Metal Forming Machines in many sizes to cover the thousands of articles made from wire and ribbon metal.

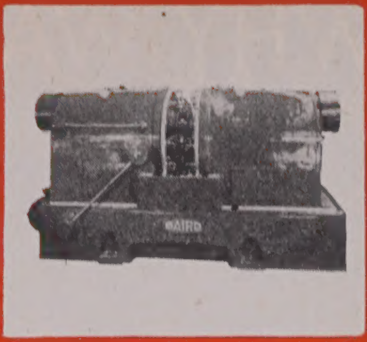
- BAIRD Tumbling Equipment for deburring, smoothing, cleaning, polishing, ball burnishing, heated drying, etc.

Send samples of *each article* you want to make in quantity.

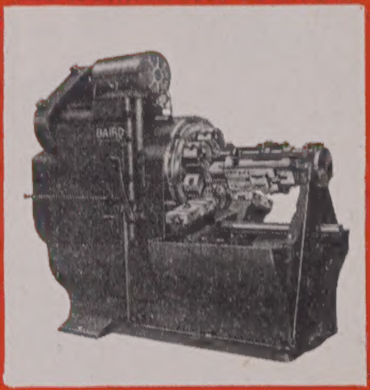
State the quantities to be made of *each piece you want* to make *in a given time.*

Give electrical current specifications AND

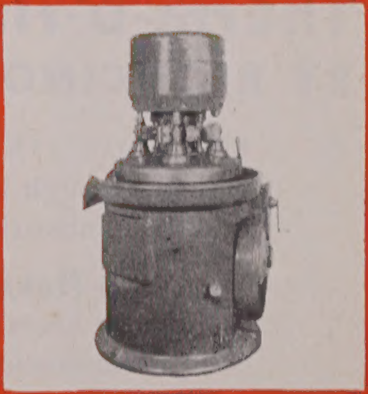
Ask BAIRD About It



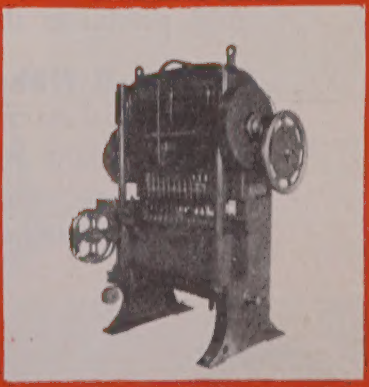
BAIRD 12 STATION DUPLEX TURNING



BAIRD 76H CHUCKING MACHINE

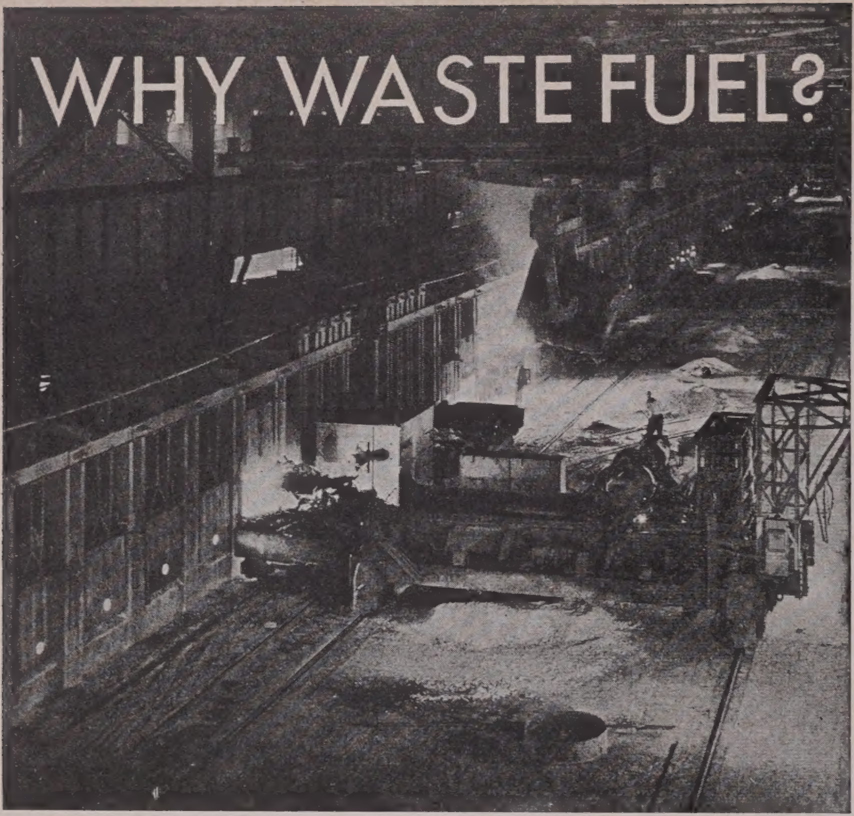


BAIRD 54VC LATHE



BAIRD MULTIPLE TRANSFER PRESS

THE BAIRD MACHINE COMPANY
1700 STRATFORD AVENUE
STRATFORD, CONN.



Therm·O·flake *prevents waste* **BY REDUCING HEAT LOSSES...**

MORE THAN 25% of Open Hearth fuel can be wasted through heat lost through brickwork and heat absorbed by cold infiltered air.

Therm·O·flake INSULATIONS are designed to reduce heat losses and seal furnace walls against cold air infiltration. These are used regularly on hundreds of open hearth furnaces and save steel producers thousands of fuel dollars daily.

Therm·O·flake ENGINEERS will prepare an accurate fuel economy survey of existing furnaces in your plant and submit complete thermal data and recommendations for safe maximum insulation of any open hearth furnace, on request.

Illinois Clay Products Company

JOLIET, ILLINOIS

Exclusive Manufacturers of

Therm·O·flake

open hearth Insulation

amine how near they came to the actual discovery.

A related case in point is the simila question "Who Discovered DDT? Here the facts are better establishe and less complicated than for stainless steels. The records show tha Othmar Zeidler first synthesized DD in 1874 and published the result o this work as his doctorate thesis. I remained, however, for Paul Muelle in the early part of World War II to discover that DDT is useful for destroying a variety of insects harmfu to human beings and plant life. This year, Paul Mueller received the Nobe Prize in chemistry for his discovery There is no question as to who discovered DDT, and there seems to be likewise, no reason for discussing the fact that a man other than the discoverer received the Nobel Prize for the compound.

One more point with regard to a question Dr. Zapffe raised with regard to absence of English patents taken out by Brearley. I believe the answer to this question comes in Brearley's autobiography ("Knotted String," p. 133, Longmans Green & Co., 1941) Brearley describes how he was persuaded by an older acquaintance to take out patents on stainless steels in this country in 1915. He goes on to say, "The reader may well ask why patents were not applied for in 1913 or 1914. The answer is that no man takes out a patent for something he considers worthless. My ideas may have been too optimistic (with regard to commercializing stainless steel) but those of Thomas Firth & Sons, Ltd., were quite otherwise, and as by the terms of my engagement I believed a patent could not be applied for in my name alone, I had first to show what a novel idea there was behind stainless steel . . . But where I failed another succeeded . . . This part of the story is best told by referring to a visit one of the Firth directors made to Krupp's works at Essen. Whilst there he noticed on the desk of his friend a particularly bright piece of steel, and on inquiry, it was described to him as a specimen of non-corrosive steel which they were investigating. He recognized the Krupp material as akin to the material I had brought to his notice months earlier. But whereas this particular director had seen nothing novel or valuable in my claims he was greatly impressed by what he heard in Essen. My suggestion that the material I offered was novel and patentable had been overlooked or ignored; but the German material, it was suggested, might be patented in England, and, if so, Krupp had promised to communicate with Firth about the question of British right."

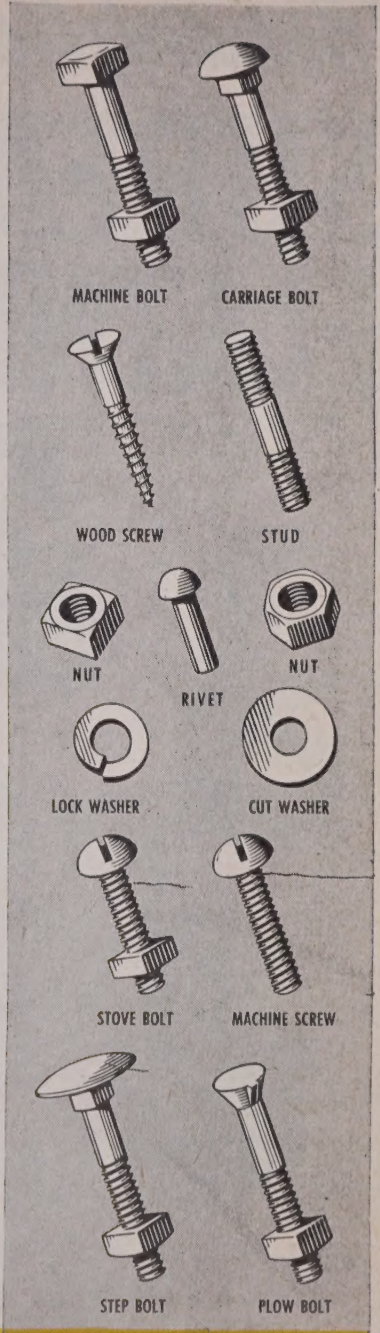
H. H. UHLIG
Associate Professor of Metallurgy
Massachusetts Institute of Technology
Cambridge, Mass.

STERLING BOLT
steel and brass
CAP SCREWS

....in all styles and sizes

Large or small—National coarse thread (U.S.S.) or fine thread (S.A.E.)—hexagon head, flat head, round head or fillister head . . . there is a Sterling Bolt Cap Screw for every purpose and specification.

Exactly the right fastening for your specification can be quickly and accurately found in the pages of our big Easy-to-Use Catalog which shows a complete line of metal fastenings. A few of the items we supply are illustrated in the panel to the right. STERLING BOLT provides a *One-Source Service* for metal fastenings that increases your efficiency and saves you time and money.


MACHINE BOLT
CARRIAGE BOLT
WOOD SCREW
STUD
NUT
RIVET
NUT
LOCK WASHER
CUT WASHER
STOVE BOLT
MACHINE SCREW
STEP BOLT
PLOW BOLT

PHONE, WIRE, TELETYPE OR WRITE TODAY!

27 YEARS OF CONTINUOUS SERVICE TO BUYERS OF METAL FASTENINGS

Send for your FREE catalog TODAY

•Thumb indexed for quick reference • Packed with valuable engineering and technical information • 200,000 items • 124 pages • Large, easy to read type.

STERLING BOLT COMPANY
203 W. JACKSON BLVD., CHICAGO 6
TELETYPE CG 488
TELEPHONE HARRISON 7-9880

STERLING BOLT COMPANY
203 W. Jackson Blvd., Chicago 6, Illinois
Please send me without obligation your new easy-to-use catalog.

NAME____________________
POSITION____________________
FIRM____________________
ADDRESS____________________
CITY____________________ STATE________

SALES OFFICES: UNION TRUST BLDG., CINCINNATI 2, OHIO • 17 W. MARKET ST., INDIANAPOLIS 4, IND. • 161 W. WISCONSIN AVE., MILWAUKEE 3, WIS. • 1228 N. HADLEY ST., ST. LOUIS 6, MO.

Productively Generate
SURFACE FLATNESS

MICRO MATIC
6 NEW MODELS
TRADE

MICROFLAT MACHINES

This cast iron valve plate for a refrigeration unit is finished on a double surface Microflat Machine to 8-microinch r.m.s. finish—optically flat and both sides parallel within 0.0001-inch. Production rate is 20 pieces per minute.

FINISH flat surfaces, on any material from soft copper to quartz or nitralloy, regardless of the shape or size of the part, in high production. Opposite sides of one or many parts are finished simultaneously on double surface machines,—productively produced to one light band of flatness and within one microinch r.m.s. surface finish. Recessed surfaces may also be finished on single surface machines.

Let us send more information at your request.

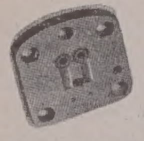
MICROMATIC HONE CORPORATION
8100 SCHOOLCRAFT AVENUE, DETROIT 4, MICHIGAN

DISTRICT FIELD OFFICES:
1323 S. Santa Fe
Los Angeles 21
California

616 Empire Bldg.
206 S. Main St.
Rockford, Ill.

55 George St.
Brantford, Ont.
Canada

Micromold Manufacturing Div.
Boston Post Road
Guilford, Conn.



LABRADOR ORES

Sir:

In a recent number, you published an article on the iron ore deposits of Quebec and Labrador, of which we would like to obtain a copy. Perhaps you will be good enough to send us the tear sheets.

G. F. MURRAY
Director

Bowring & Company
New York

● The article "Quebec-Labrador, Canada's Iron Ore Jackpot," which appeared in the Nov. 4, 1948 issue, has been mailed.—Ed.

GALVANIZED SHEETS

Sir:

Would you be kind enough to give us the names of producers of galvanized sheets. Also, could you give us any leads on where or how to procure galvanized sheets. We are one of those firms that was left without a source of steel by the sale of the mills we had always bought from.

H. B. FREELAND

Freeland Sons Co.
Sturgis, Mich.

● We are sending a list of galvanized sheet producers. As to getting more sheets, however, there is little we can suggest. The best bet for the small user is simply to take all the sheets he can find, even though the specifications are not exact, in the hope of trading for or converting to the proper type. Possibly, for you, this might mean the purchase of black sheets which you could then have galvanized on a contract basis.—Ed.

DIE SETTING

Sir:

Please send a copy of the article "Die Setting and Economical Punch Press Operation" which appeared in the Nov. 18 issue.

WALTER FAAS
Chief Engineer

Bates Mfg. Co.
Orange, N. J.

COLD FORGING

Sir:

Kindly send me tear sheets of the article "Modern Cold Forging Practice" appearing in the Nov. 11 issue.

DON POOR
Promotion Manager

Ceco Steel Products Corp.
Chicago

HIGH-SPEED STAMPING

Sir:

We would like to obtain a tear sheet copy of "High Speed Stamping of Electrical Terminal Plugs" from the issue of Mar. 18.

J. T. RICHARDS
Engineer

Beryllium Corp.
Reading, Pa.

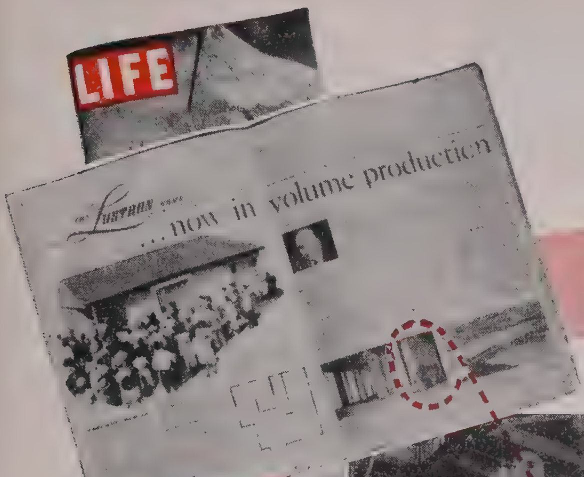
HEATING OXIDIZABLE METALS

Sir:

We have been referred to a technical article which appeared in your May 20 issue entitled "Heat Processing Easily Oxidized Metals." We

Warco Presses Can't be Beat where Economical Production is Essential

Warco Presses are designed and built by specialists with years of press experience. They are manufactured under facilities recognized throughout the industry as being the finest in the nation. These are reasons why Warco Presses set the pace where economical maintenance-free press operation is required.



The Lustron Home ... now in volume production

Warco
PRESS

The Lustron Corp. selected their machinery with an eye to mass production at minimum costs. That's why approximately 80 giant Warco Presses—like the one featured in Life—are working around the clock at Lustron's huge Columbus, Ohio, plant.

Federal WELDERS ®

RESISTANCE WELDERS FOR EVERY APPLICATION • FROM 50-TON OBI TO 2000-TON DOUBLE ACTION

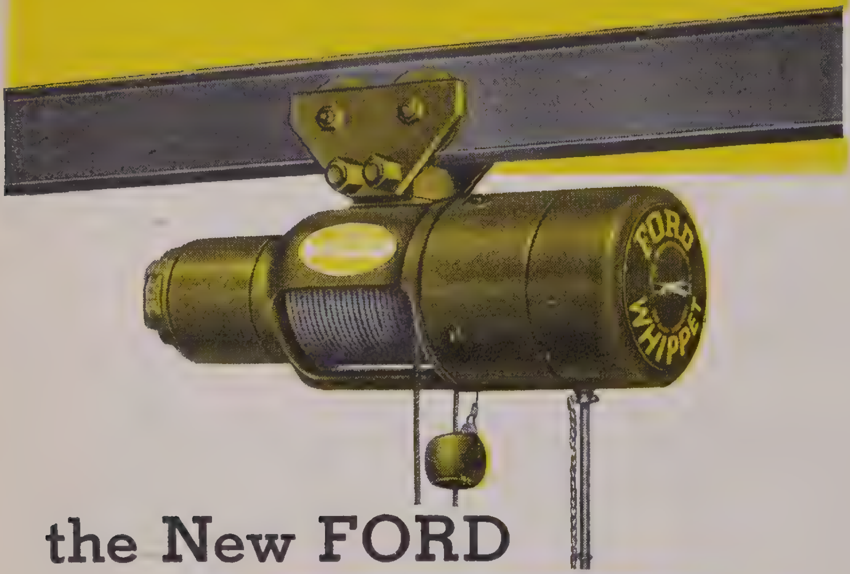
THE FEDERAL MACHINE AND WELDER COMPANY

Dept. 7128 Warren, Ohio • Offices in Principal Cities

Warco PRESSES ®

they say it's

SLICK AS A WHIPPET!



the New FORD

WHIPPET

ELECTRIC HOIST

■ You'll say the same when you start using a new FORD *Whippet* Electric Hoist. It is fast, safe, dependable, rugged. Low in first cost—in operating and maintenance costs. It's *the answer to your* material handling problems—a big part of production expense. Capacities from 250 to 2000 pounds. Send today for your copy of folder DH-1325.

Ask your FORD distributor about the famous FORD Tribloc. He also offers a wide range of high quality spur-gear, screw and differential hoists—other special hoisting equipment.

ACCO

York, Pa., Chicago, Denver, Los Angeles, Philadelphia, Portland, San Francisco, Bridgeport, Conn.

FORD CHAIN BLOCK DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

In Business for Your Safety

cannot locate our May 20 issue and would appreciate having a copy of the article.

F. C. SCHAEFER

American Gas Furnace Co.
Elizabeth, N. J.

HYDROGEN EMBRITTLEMENT

Sir:

Please send two copies of "Evaluating Hydrogen Embrittlement in Acid Pickling" from the June 17 issue.

D. A. WILSON

Canadian Westinghouse Co., Ltd.
Hamilton, Canada

RESEARCH WITH ISOTOPES

Sir:

We would appreciate three tear sheet copies of the article entitled "Industrial Applications of Radioisotopes," which appears in the Oct. 28 issue.

R. E. DRURY
Foreign Department

C. Tennant, Sons & Co., of New York
New York

ELECTRIC FURNACE PRACTICE

Sir:

Our melt shop superintendent would like to have a copy of the article "Single Slag Basic Electric Furnace Practice" from the Sept. 30 issue.

G. R. REINDEL
Office Manager

Allegheny Ludlum Steel Corp.
Brackenridge, Pa.

PICKLE LIQUOR REGENERATION

Sir:

We are in need of an extra copy of the Sept. 30 issue. Either the issue or a tear sheet of the article "Regeneration System for Pickle Liquor" will do.

N. A. STONER
Librarian

E. F. Houghton & Co.
Philadelphia

● Tear sheets of the article are being sent. —Ed.

COPPER BRAZED JOINTS

Sir:

Can you please supply two copies of the "Properties of Copper Brazed Joints" article appearing in the Sept. 30 issue. Our engineering department is interested in comparing the test results of joints brazed in a wet atmosphere with joints obtained with the dry atmosphere used in our plant.

R. E. JONES
Vice President

Superweld Corp.
Glendale, Calif.

PERSONALITY COUNTS

Sir:

I would appreciate being supplied 5 or 6 copies of the article "Personality Factors in Future Employee Selection" which appears in the Nov. 11 magazine.

GEO. P. GENTRY
Manager, Materials Div.

Phillips Petroleum Co.
Bartlesville, Okla.

The IRON AGE

Vol. 162, No. 26 December 23, 1948

Editorial

A Fox or a Goose 43

○ ○ ○

Technical Articles

Repairing Gray Iron Castings by Welding 46
How to Make Best Use of Gage Block Accessories 52
Moly Mold Samples for Spectrographic Analysis 57
Gold and Chromium Combination Plating 60
Colorimetric Determination of Cu in Tin and Lead Alloys 62
Hills of Hematite—Part II 64
New Equipment 70

○ ○ ○

Features

Fatigue Cracks 28
Dear Editor 30
Newsfront 45
Assembly Line 74
Washington 78
West Coast 82
Personals 86
European Letter 90
Industrial News Summary 93
News of Industry 95

○ ○ ○

News and Markets

Industrial Briefs 98
Coal Board Research Budget 109
Bids for Egyptian Scrap 110
Navy Studies Overload of Gears 111
ASM's Western Metals Show 112
Steel Shipments Break Records 115
Gray Iron in Tools and Dies 115
Machine Tool Developments 116
Nonferrous News and Prices 118
Iron and Steel Scrap News and Prices 121
Comparison of Prices by Week and Year 124
Finished and Semifinished Steel Prices 125
Alloy Steel Prices 126
Pipe and Tubing Prices 127
Warehouse Steel and Pig Iron Prices 128
Ferroalloy Prices 129

○ ○ ○

Index to Advertisers 153-154

THOMAS L. KANE
Publisher

○ ○ ○

B. H. HAYES
Production Manager

O. L. JOHNSON
Manager Market Research

○ ○ ○

CHARLES T. POST
Manager Circulation and Reader Service

○ ○ ○

J. R. HIGHT
Promotion Manager

○ ○ ○

Executive Offices
Chestnut and 56th Sts.
Philadelphia 39, Pa., U.S.A.
Editorial and Advertising Offices
100 E. 42nd St., New York 17, N. Y., U.S.A.

○ ○ ○

Regional Business Managers

FRED BANNISTER
W. Hartford 7, Conn.
62 La Salle Road

ROBERT F. BLAIR
Cleveland 14
1016 Guardian Bldg.

C. H. OBER
H. E. LEONARD
New York 17
100 E. 42nd St.

PEIRCE LEWIS
Detroit 2
103 Pallister Ave.

B. L. HERMAN
Philadelphia 39
Chilton Bldg.

STANLEY J. SMITH
Chicago 3
1134 Otis Bldg.

J. M. SPACKMAN
Pittsburgh 22
814 Park Bldg.

R. RAYMOND KAY
Los Angeles 28
2420 Cheremoya Ave.

○ ○ ○

One of the Publications
Owned and Published by
CHILTON COMPANY
(Incorporated)

OFFICERS AND DIRECTORS
JOS. S. HILDRETH, *President*
EVERIT B. TERHUNE Vice-President
P. M. FAHRENDORF Vice-President
JULIAN CHASE Vice-President
THOMAS L. KANE Vice-President
G. C. BUZBY Vice-President
CHARLES J. HEALE Vice-President
WILLIAM H. VALLAR, Treasurer
JOHN BLAIR MOFFETT, Secretary
HARRY V. DUFFY T. W. LIPPERT
D. ALLYN GARBER

○ ○ ○

GEORGE MAISWINKLE, Asst. Treas.

○ ○ ○

Chilton Editorial Board
PAUL WOOTON
Washington Representative

○ ○ ○

Member, Audit Bureau of Circulation

Member, Associated Business Papers

○ ○ ○

Indexed in the Industrial Arts Index and the Engineering Index. Published every Thursday. Subscription Price United States, its Territories and Canada $8; other Western Hemisphere Countries $15; Foreign Countries $20 per year. Single copy, 35c. Annual Review Number, $2.00.

○ ○ ○

Cable Address, "Ironage" N. Y.

○ ○ ○

Copyright, 1948, by Chilton Company (Inc.)

Pathway to Peace

Peace is many things. It is the harmony of nations, the unity of peoples, the comfort of a home—the quiet beauty of a country church at Christmas time.

An intrinsic part of peace is industry. For in industry lie the potent seeds of progress, the hope of prosperity, the way to better living.

We always endeavor to contribute, to the best of our ability, to these ends.

To you, our customers and friends, we extend our good wishes this Christmas time. We shall appreciate your continued patience and understanding during the coming year. And, together, may we make our small contribution toward the pathway of peace.

JOSEPH T. RYERSON & SON, Inc.

RYERSON STEEL

The IRON AGE

100 E. 42nd ST., NEW YORK 17, N. Y.
ESTABLISHED 1855

o o o

December 23, 1948

o o o

THOMAS L. KANE
Publisher

o o o

T. W. LIPPERT
Directing Editor

Editorial Staff

News, Markets Editor T. C. CAMPBELL
Technical Editor........W. A. PHAIR
Metallurgical Editor...E. S. KOPECKI
Machinery Editor.........T. E. LLOYD
Art Editor.............F. J. WINTERS
Ass't News, M'rk'ts Ed. W. V. PACKARD
Associate Editor...H. W. VAN CAMP
Associate Editor....A. D. STOUT, JR.
Associate Editor..........T. S. BLAIR
Associate Editor........S. D. SMOKE

o o o

Contrib. Editor......J. S. LAWRENCE

Foreign Editors

England (Contrib.)....F. H. HARLEY
54 Priory Way, North Harrow, Middlesex, England
Canada (Contrib.)...F. SANDERSON
330 Bay St., Toronto, Canada
Paris (Contrib.)......PIERRE BENOIT
59 Rue Manin, Paris XIX, France

Regional News and Technical Editors

G. F. SULLIVAN
Pittsburgh 22
814 Park Bldg.

D. I. BROWN
Chicago 3
1134 Otis Bldg.

JOHN ANTHONY
Philadelphia 39
Chilton Bldg.

EUGENE J. HARDY
KARL RANNELLS
GEORGE H. BAKER
Washington 4
National Press Bldg.

W. A. LLOYD
Cleveland 14
1016 Guardian Bldg.

W. G. PATTON
Detroit 2
103 Pallister Ave.

OSGOOD MURDOCK
ROBERT T. REINHARDT
1355 Market St., San Francisco 3

Editorial Correspondents

L. C. DEAN
Buffalo

N. LEVENSON
Boston

JOHN C. McCUNE
Birmingham

ROY EDMONDS
St. Louis

JAMES DOUGLAS
Seattle

HERBERT G. KLEIN
Los Angeles

Editorial

A Fox or a Goose?

NOT quite six centuries before the Christian era, a Greek named Solon lectured the Athenian Assembly on gullibility. An ambitious, wealthy young nobleman named Peisistratus had just rushed into the Assembly bleeding from apparent wounds. He demanded the right to a personal bodyguard of 40 to 50 men, a practice which the Athenians, fearing dictatorship, had banned. The act did not deceive Solon. When he saw that his fellow-legislators were about to swallow this play, he warned them: "Fellow Athenians: Individually you walk with the tread of a fox. Collectively you act like a flock of geese."

This admonition might well be addressed to present-day Americans. Consider European aid. Depending on the manner of calculation, this country has already contributed from $20 billion to $30 billion to European recovery since the end of the war. Unofficial advices from the capital suggest that Truman may ask Congress for another $6½ billion. To this must be added further billions earmarked for European rearmament.

Obviously the purpose of such prodigious sacrifice on our part is not altruistic. Stalin has succeeded to the mantle of Hitler as a menace to world peace. We believe that the free portion of the world shares with us the need for an effective defense against communist aggression. Our contributions are designed to create roadblocks against the sweep of Kremlin power.

The appropriation of added billions by Congress will be painful. The burden of spearheading the anti-communist front has killed all hope of further tax reduction. The President will again ask for an increase in taxes. The allocation of this greater load is the only problem which Congress will discuss.

Let's turn now to France, next to England the principal beneficiary of American aid. Early this month the Radical Socialists, the party of Premier Henri Queuille and Edouard Herriot, at the end of a four-day national meeting passed the following resolution:

"Noting the growing division of the world into two hostile blocs and an atmosphere of distrust and suspicion, the party affirms that France has no responsibility in this state of things and that she ought to limit her action to shielding herself from its effects."

Two days after the adoption of this resolution, the French government expressed the hope that we would release in advance the 280 billion francs (approximately 1 billion dollars) which it is expected will accumulate in the counterpart fund during the calendar year 1949. This sum represents the proceeds in francs of American aid sold in French markets and impounded pending its use for reconstruction and currency stabilization.

The occasion for immediate release of the counterpart fund is "to avoid another heavy exceptional tax levy which Parliament would not accept." The Radical Socialists propose to send Edouard Herriot to Washington to secure the immediate release of the counterpart accumulations. The imposition of a heavier tax for French reconstruction and stabilization might jeopardize the present French government, precipitate a general election and bring de Gaulle to power. For precisely this reason de Gaulle, who has been theatrically sensitive to "foreign interference," wants the release of counterpart funds deferred until he has taken over the government.

What does all this make Uncle Sam — a fox or a goose?

Joseph Stagg Lawrence

THE FLOORING...

that lets her

Step out Safely

Inland 4-Way Floor Plate prevents slips and falls on bus and truck steps and platforms. Its projecting tread grips feet like a gear tooth. Even when wet it provides positive traction in all directions, preventing many a dangerous accident. In addition to its many advantages on steps, catwalks, and platforms of buses and trucks, Inland 4-Way Floor Plate is the perfect safety flooring for general plant use. It is convenient to cut, form, or weld, and lasts for years and years. Write for booklet.

INLAND STEEL CO., 38 S. Dearborn Street, Chicago, Ill. Sales Offices: Chicago, Davenport, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul.

INLAND STEEL

BARS • STRUCTURALS • PLATES • SHEETS • STRIP • TIN PLATE • PILING • REINFORCING BARS • RAILS • TRACK ACCESSORIES

INLAND 4-WAY FLOOR PLATE

IRON AGE
December 21, 1948

NEWSFRONT

- Steel labor will probably get their last big chance for more money in 1949 because that may well be the steel output peak for some years to come. Pensions and social security will be high on the list of union demands. If there is an impasse in steel labor negotiations next year--the steelworkers will strike.
- Biggest job facing motor car producers is to get themselves in a position to cut production costs quickly if a substantial break occurs in the market for new cars. Production problems receiving a lot of attention in Detroit nowadays are: design of the part for manufacturing, machine feeds and speeds, automatic handling between press operations and reduced overhead.
- To avoid building up a distorted cost picture, one mining machinery manufacturer uses an accounting system that carries all additional charges for premium, gray market or conversion steel in a special account. Only regular mill or warehouse prices plus freight appear on the bill of material. Result: when this company can again buy all its steel through normal channels, it will be easy to revise raw material cost estimates any time steel prices are revised.
- At the present time, magnetic taconite concentrate is so fine it cannot be sintered economically, according to some experts. Solution is thought to lie in pelletizing, which can be performed for 60 pct of the cost of sintering, and is perhaps one of the key processes in the preparation of the concentrates of the future.
- Skip welding, a technique of intermittent submerged arc welding, is being used to weld stamped flywheels to forged steel ring gears by an automotive manufacturer.
- Rumors persist in the Cleveland area that a major steel producer is exploring the possibilities of constructing a completely integrated steel plant, from blast furnaces to rolling mills, on the southern shore of Lake Erie to take advantage of low cost water transportation.
- Recently observed in an industrial plant was a list of subversive agencies known to be active in the United States. The list is at least 10 pages long, and single space typed on both sides. The list includes all organizations from pink to purple and classifies them as Communist, Fascist, anti-Republic, etc.
- Unlike some labor leaders who frown on technological improvements, John L. Lewis has registered no complaint about the continuous coal mining machine although it appears certain to have far reaching effects on the industry. Lewis has never kicked about men being thrown out of employment providing those left on the job get better pay for shorter hours.
- Fabrication in transit freight rates under a strict f.o.b. system may not continue. Some consumers in the past have made money by using such rates under the old delivered price system. Freight experts declare the key to this possibility rests on whether a buyer can retain ownership during the entire movement.
- A close nationwide check reveals that the gray iron foundry business is singing the December blues. Hardest hit are the small jobbing foundries. The big tonnage foundries are holding up better. But one reason is that they have called in some of their work that had been farmed out to the jobbing foundries. Most frequently heard explanation is that the slump is caused by year end inventory corrections.
- Steelmakers looking for escalator clauses in government contracts are worried about the fact that some allow for only 20 pct increases. Not that any now have plans for big increases in base prices. But those who haven't announced hot rolled sheet and strip extras know that others have so far boosted those extra charges by far more than 20 pct. Besides, they're worried about the effect of all steel prices on the fourth wage round.
- Contrary to the opinion gaining credence in some quarters, the United States is not a "have not" nation in metals production. This country is the largest mine producer of copper, lead and zinc in the world and current exploration programs are expected to continue our leadership. But our consumption of metals has been stepped up tremendously so that we are heavily dependent on imported metals and concentrates.
- A plan for the expansion and reequipment of Brazil's railroad system at a cost of more than $300 million was recently submitted to the Transport Committee of the United States-Brazil Technical Mission. Largest allotment of funds under the program is for rolling stock and the second largest is for rails. Special provision is to be made for electrification of the project.

Repairing Gray Iron Castings by Welding

Recent advances in welding and welding equipment have caused a widespread increase in the use of welding to achieve longer life and more efficient service from industrial equipment. Repair and maintenance of cast parts in such equipment by welding, as described in this article, offers many economies.

∘ ∘ ∘

By L. AMES
Air Reduction Sales Co.,
Philadelphia

∘ ∘ ∘

RESULTS when gray iron castings are more or less variable, especially with heavy castings where it is difficult to achieve satisfactory local conditions for making welds. Such welding is usually confined to salvage or repair work occurring at infrequent intervals, each job presenting a different problem.

A number of methods have proved successful, but the most common methods in use are oxyacetylene welding or brazing, metallic arc welding, and carbon arc welding. To achieve maximum results from these methods, certain procedures should be followed before, during, and after each welding operation. These fundamental procedures relate to preparation, alignment, preheating, equipment and proper working conditions.

Preparation for welding is influenced and should be preceded by a consideration of the type of service required of the casting. It is a good rule to check its weldability. Chips can be checked to determine whether the casting will tin easily if it is to be brazed, or whether it can be readily welded with the torch or metallic arc if these processes are to be used.

Other points requiring preliminary consideration are: (1) Whether a color match is necessary; (2) whether the welded section will require machining, drilling or tapping after welding; and (3) whether the casting is to be subjected to a temperature of 500°F or over. In chemical processes, materials may be used that do not affect cast iron but will affect bronze. Ammonia pumps are a good illustration. It is obvious that repairs to cast iron parts in such cases should be made by fusion welding.

Following these preliminary considerations, the casting should first be cleaned to remove all oil, paint, grease and rust. It is then chipped, ground, or burned to within ⅛ in. or less of the bottom of the fracture. Chipping is preferable, because it leaves the cleanest surface.

If the casting has been V-cut with a torch, a carbon arc or metallic arc, it should be ground to remove as much of the oxide as possible. The top surface adjacent to the V should be cleaned at least 1 to 2 in. on each side of the edges of the V. Sections 1 in. thick or less are usually chipped from one side only. On heavier sections, it is advisable to chip from both sides, provided both are accessible to welding. Generally, a 75° or a 90° V-joint is wide enough to enable the operator to manipulate his torch or electrode and to get to the bottom of the joint.

If metallic arc welding is to be used in a V-joint, it is desirable to use threaded studs in the groove. These may vary in size from ⅛ in. for thinner sections to ½ in. for heavy sections. Distribution of studding is important. On the smaller sizes, the studs should be ½ in. apart and evenly spaced over the weld area. On the larger sizes, they may be anywhere from 1 to 2 in. apart. Care must be taken to obtain good fusion around and to the studs, thus attaching the metal to the studs, which in turn are secured in the cast iron below the heat-affected zone.

Proper alignment is important. Pieces that have broken out should be checked to make sure that none are missing. These can sometimes be welded together on a bench, and then tack-welded in one piece. The requirement for accuracy of alignment varies with different types of work, especially when shaft bearings or similar objects must line up properly in the finished job. C clamps, bars, wedge bars, turn-buckles, V-blocks or jigs should be used when one piece has to be held in place during preheating and welding.

Small castings of intricate shape are usually harder to hold in alignment than large sections. It is advisable to follow out a sequence during the welding operation to avoid distortion or warpage.

Heavy castings present special problems in alignment. They offer less danger of distortion and warpage, but require proper spacing and support to reduce sagging during preheating and welding. Too often failure blamed on warpage is caused by sagging because of improper support.

It is sometimes possible to salvage a casting that has sagged out of alignment by reheating and sagging it back into place with weights while it is heated. However, properly supported and aligned castings can usually be held to tolerance if welded in the proper sequence.

Preheating before welding helps avoid shrinkage stresses and subsequent cracking caused by uneven expansion during welding and by contraction upon cooling. The hard zone adjacent to the line of fusion can be avoided when the casting is gas-welded and can be reduced when carbon or metallic arc processes are used. Preheating also saves welding gases. When the fracture is confined in the casting, generally the entire casting should be preheated. However, if the fracture is in a section that can expand endwise, a local preheat is usually sufficient. Slow preheat is best, as it enables both the heavy and light sections to absorb heat uniformly, and permits uniform expansion over the entire casting.

Charcoal is the preferred fuel for preheating purposes, because it burns with a soft, even heat and requires no forced draft. No soot or smoke is given off to deposit on the metal or hinder the welding operation. However, provision should be made for escape of carbon monoxide gases produced.

Torches are available for such preheating fuel gases as kerosene, oil, natural gas and propane. Care should be taken to move the torches from time to time so that they do not play too long on one point of the casting. Moving them spreads

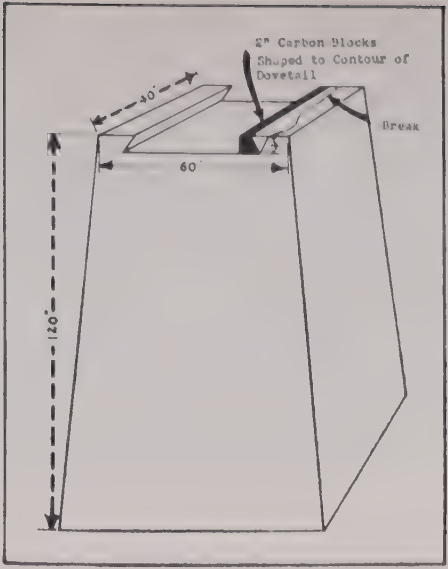
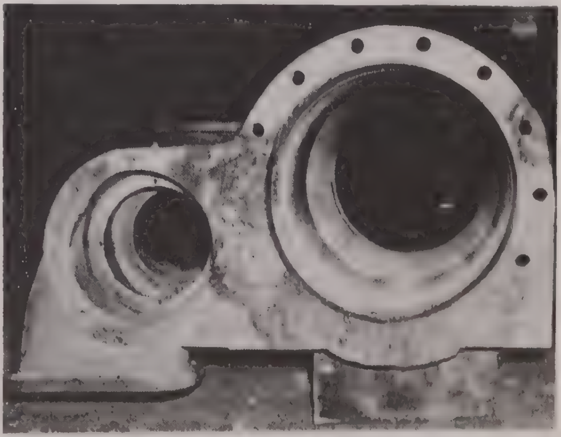


FIG. 1—Using a carbon block shaped to the contour of the dovetail of this 60 ton forging hammer anvil base, the break shown was repaired by fusion welding.



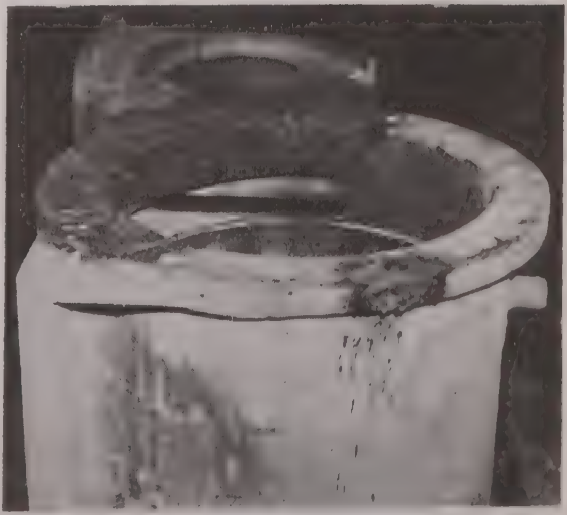


FIG. 2—Top and front view of the steam chest showing weld repairs made to the flange. The flange thickness varied from 2 to 4½ in.

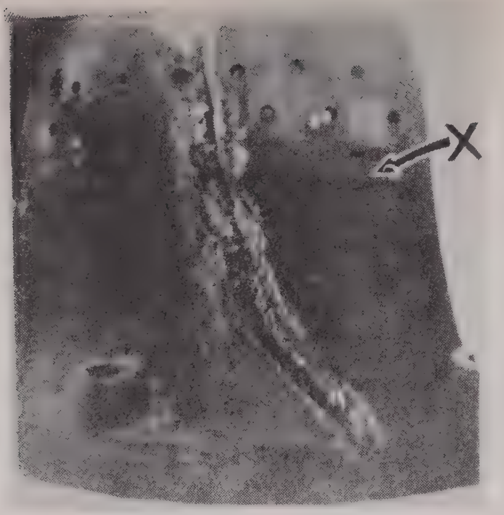


FIG. 3—This broken steam engine base was brazed after it had been previously repaired by arc welding.

the heat evenly. When heavy and light sections are present in a casting, the heat should be directed more to the heavier section to obtain the greatest degree of uniformity between the heavy and light sections. For gas torch or carbon arc welding a preheating temperature of 1000°F, or over is preferred; for brazing or metallic arc welding 500°F is usually sufficient.

In gas welding or brazing a heavy casting, a great deal of heat input is required at the surface adjacent to the weld to compensate for heat losses due to conduction by the casting. Naturally, the heavier the casting, the greater the flow of gases required for this purpose. Equipment should be used that will deliver the necessary gas for heavy welding jobs of this type. When large tips are used, three or more acetylene cylinders should be manifolded together to assure an ample supply.

Standard acetylene regulators deliver 150 cu ft of acetylene gas per hr at 15 lb pressure, which is ample for the average welding or heating tip so long as the hose is 5/16 in. ID with large glands to reduce restriction to gas flow. Torch tip extensions are sometimes used to lengthen the distance between the operator and the molten puddle, thus reducing the heat radiated on the operator. Arc welding helmets, with No. 5 or No. 6 shade lenses, are also sometimes used in place of goggles to give more protection to the operator's face.

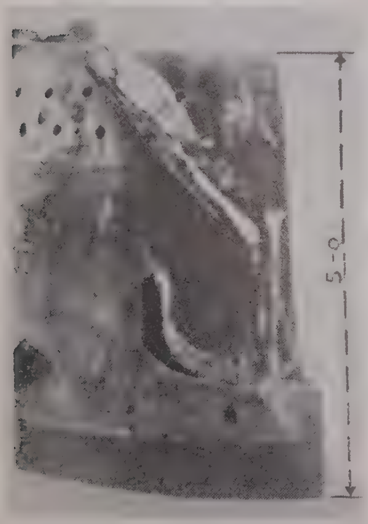
Large castings, 1 to 6 tons, radiate a great deal of heat when preheated to 1000°F or over, causing undue operator fatigue unless he is relieved at frequent intervals. On large welding operations, enough welders should be scheduled to relieve at intervals of 20 to 30 min. This is good practice from a safety angle, and enables the men to do a better job with less fatigue.

An example of fusion welding on a cast iron section weighing 60 tons is illustrated in fig. 1. Good compression strength and resistance to a certain amount of impact are required of this section of the anvil base under service conditions. The dovetailed groove tapers from front to back, which allows fitting several types of anvils in the groove and holds them firmly in place. The broken section of the dovetail was 40 in. long, 6 to 10 in. wide, and about 4 in. thick, and had to be built up to restore its size.

On several occasions attempts had been made to repair the anvil base by studding the electric arc welding. Because of impact and compression at this point of the base, the welds pulled away and in time studs loosened up. Bronze welding was tried, but was found to mush out and be too soft.

Oxyacetylene fusion welding was suggested. All the old bronze weld and studs were chipped out to good, sound metal. The casting was preheated for 18 hr, using three natural gas torches. The torches were moved every 2 hr to insure even spread of the heat into the casting. During the last 4 hr of preheating, more compressed air was used in the mixture. By so doing, the area to be welded and its adjacent area were preheated to as high a temperature as practicable to avoid any line of demarcation at or near the weld area. The importance of getting a good soaking heat into heavy castings prior to welding cannot be overemphasized.

At the start of the welding operation, operators played their torches on the weld surface until the proper temperature was reached before any metal was added. A good grade of cast iron will flow

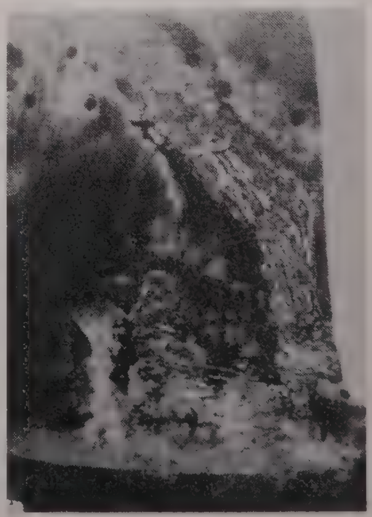


LEFT

FIG. 4—Another section of the base in fig. 3 shows the previous carbon arc weld removed prior to brazing.

RIGHT

FIG. 5—View of the section shown in fig. 4, after brazing. Cracks in the two sections of the base were repaired separately.



practically the same as bronze when the right temperature has been reached.

Two-flame tipped torches with 12-in. extensions were used to reduce heat radiation. Six welders were used on this job, relieving at intervals of 20 min. Two laborers assisted, breaking the welding rod into small pieces, changing cylinder manifolds and doing other odd jobs for the welding operators.

Cast iron rod used on this job was 3/16 and ¼ in. diam. It was found that by breaking the rod into 1 to 2 in. pieces and shoveling them into the puddle, more metal could be added in a shorter time. Smaller diameter welding rod would melt with one pass of the torch. Larger diameter rod would melt on the surface, but the bottom of the rod would lie in the molten cast iron and presented danger of cold rod laps or laminations.

The torches were held so that the blue flame was anywhere from ½ to 1 in. away from the molten cast iron. It was found that this method permitted a better spread of heat and reduced the tendency to develop blow holes in the weld metal. Both gases were manifolded.

Total welding time was 16 hr, representing a total of 96 hr of torch time for the six welders. Rod consumption totaled 275 lb and 14 lb of flux were used. Gas consumption totaled 4500 cu ft of oxygen, and 4200 cu ft of acetylene. Estimated saving over the cost of a new base was $6,200, and savings in down time close to $18,000.

A Pennsylvania steel mill had a break in the piston rod of a universal mill reversible engine, used for rolling steel plate. The impact of the piston broke the cylinder head and pulled the studs out of the cylinder flange, breaking out sections of flange.

A screen or netting was placed about 20 in. from the top of the cylinder. When the plate was removed to show the inside of the preheating oven, the temperature of this casting was approximately 1200°F. The outside section of the preheating oven was ½ in. plate tacked together to keep the outside of the casting from cooling too rapidly.

The operators played torches around the area to be welded. This was done prior to adding filler material. To avoid building a welding platform, the bottom was placed in the locomotive pit. The bottom was covered in the same way as the top to reduce draft on the charcoal. Small openings were made in the asbestos paper on the top to reduce heat loss as well as heat radiation on the operator's face.

Top and side views of the cylinder several days after it had been welded and cooled are shown in fig. 2. The thickness of the flange varied from 2 to 4½ in. at the steam chest. No blow holes or porosity were found in the deposited weld metal. The weld was later machined and found to be without hard spots or porosity; nor was there distortion in the cylinder.

The cylinder, from a Porter-Hamilton reversible steam engine, has a bore 30 in. in diam, is 7 ft 2½ in. long, and weighs 10,700 lb. The cost of a rough casting before machining would have been $1,975, and the cost of the machining would have been $1,500. By contrast, the repair job involved 60 lb of ¼ in. cast iron rod for filling in broken stud holes, 5 lb of flux, 800 lb of charcoal, and 8 hr of continuous labor by a crew of three.

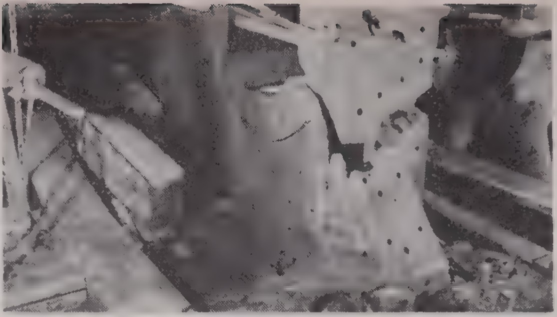


FIG. 6—This broken bearing pedestal of a Corliss engine had been previously repaired twice by welding and once by drilling and plating. Large gaps, caused by pieces that broke out and were lost made the repair job more difficult.

Some years ago, a failure occurred in a section of a 750 hp steam engine used for powering a 26-in. alloy steel plate mill. A local job shop carbon arc welded the base, using steel plate to reinforce the weld. The effectiveness of this repair job is evidenced by the fact that the engine gave 25 years more of continuous service before breaking down again.

The second break in the engine base is shown in fig. 3 with some of the old carbon arc weld removed on one side. The *X* indicates some of the old carbon arc weld that was not removed in preparation for the new brazing job.

Another section of the base, with the old carbon arc welds removed, is shown in fig. 4. The wide gaps were corrected by tack-welding a steel plate on the inside of the base, which acted as a backup for the bronze. The old carbon arc weld, too hard to chip, was washed out with a torch, accounting for the wide gaps. This section is shown in fig. 5 after brazing.

The cracks in both broken sections of the base were welded separately then aligned so they could be brazed at the bearing pedestal. The weight of both sections was 12 tons. With all of this welding, the pedestal casting was found to be less than ⅛ in. out of true, which was taken up by the bearing. This job was welded from each side simultaneously.

The steam engine upright had a piece broken

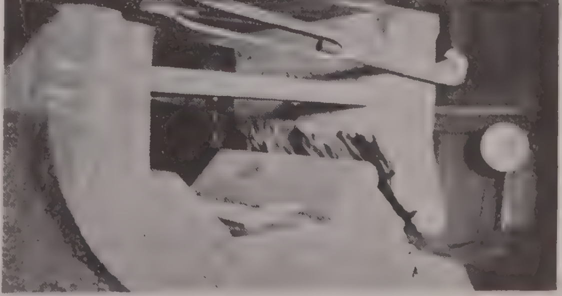


FIG. 7—A side view of the broken pedestal shows the turnbuckles for aligning the parts for brazing.

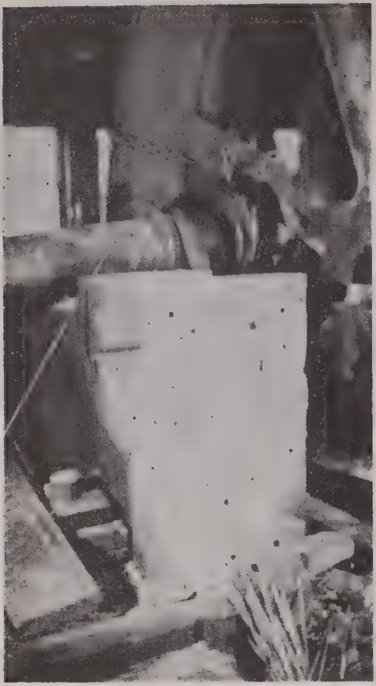


FIG. 8—After brazing the engine pedestal appeared as shown here and savings by welding were reported to be about $4200.

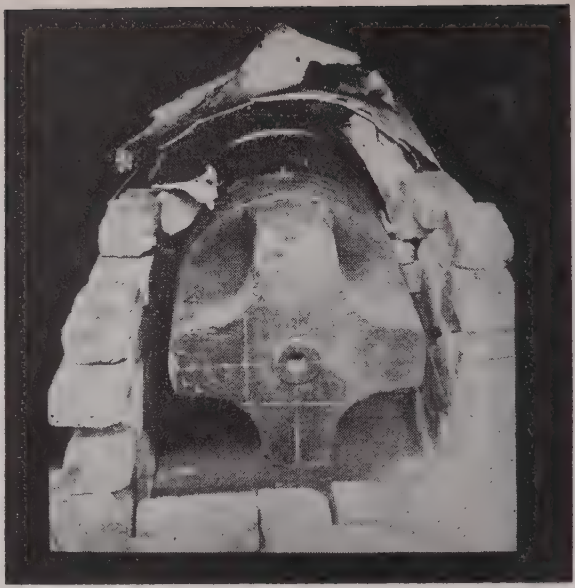


FIG. 9—Preheated to 900°F with a torch, the wobbler end of this roll was built up by carbon arc welding.

out and missing. A 2-in. steel plate was used to replace the broken section at the bottom. This was later machined to the proper contour required on the upright. The base plate to which the vertical steam engine was bolted was grouted into a concrete base in copper to absorb shock and vibration. This plate is 5 in. thick, 16 ft long, and 11 ft wide. It was chipped from both sides to a 90° bevel. Two operators worked simultaneously on the job. One pass was put in by each man from each end, working towards the center. The casting was turned over, and the process repeated on the opposite side. Each of the welds on this plate was 48 in. long and about 3 in. wide on the top surface.

This engine was used on a 26-in. stainless steel plate mill, an old type hand mill on which catcher, passers, and rollers are used, so that there were over 100 men made idle by its failure on a three-shift per day basis. All this welding was accomplished in four days. Three men were used on each shift, working on a 24-hr day welding basis, with a total of nine welders. Two laborers were used on each shift for miscellaneous work. Gas consumption for melting out the old carbon arc welds and for brazing totaled 15,500 cu ft of oxygen and 12,000 cu ft of acetylene. The job used 1050 lb of bronze rod and 50 lb of flux. According to the chief engineer, salvage of the old engine saved about $50,000. However, the savings on down time loss were many times greater, for no new engine or even parts for an old one could have been obtained.

A manufacturer of soil clay pipe had a 500-hp Corliss engine that had fractured at the bearing pedestal. This engine was about 50 years old, and a new base was not available, nor was it possible to obtain patterns. A local job welding shop tried to do the job on two different occasions, and both times the welds failed because the crack had not been chipped to the bottom of the fractured section. The company was convinced that welding was no good, and the pedestal was drilled and plated. The engine worked this way for ten years, when the studs finally worked loose and repairs had to be made again.

The front view of the pedestal in fig. 6 shows the holes used when the pedestal had been plated. The large gap was caused by small pieces that had broken out over a period of time after studs became loose. Pieces of steel plate were used to backup bronze during the brazing operation.

The side view of the pedestal in fig. 7 shows the turnbuckles used on the sides, the plate on top and the 2-in. square stock in the center section for alignment. Four welders were used on this job continuously for 11 hr, two men at one time working from each side.

The pedestal, after brazing, is shown in fig. 8. Engine bolts were loosened before preheating with an oil torch for expansion at the bottom of the pedestal. The job shop manager now has two welders working continuously on repairs in this plant because he was successful with this job. Savings were around $4,200. Rod used amounted to 190 lb of bronze, and gas consumption came to 1800 cu ft of oxygen and 1700 cu ft of acetylene.

In both of the last two jobs described, bronze was recommended and used as the filler material. This choice was made because fusion welding would not have been practical for either job; nor would carbon arc welding have served because of wide gaps and other factors such as contraction strains even with preheating.

The metallic arc could have been used, but, in both cases it was too hard to chip and therefore was too hard to drill for studding. In both instances, brazing was suitable, metal deposit was rapid, and preheat temperatures before and during the welding operation were low.

In the use of alloy steel and cast iron rolls for rolling purposes, wobbler ends generally offer some probems because of wear and batter from impact and abrasion. Repairing wobbler ends is usually a standard welding job, the frequency of building up depending to a great extent on the supervision and condition of the mill in which they are in service.

Fig. 9 shows a roll set up for carbon arc welding. The wobbler end was preheated to 900°F, with a natural gas torch and welded with the carbon arc. A water cooled carbon arc torch with ¾ in. carbon rod at 500 amp current was used. The wobbler ends were then brought back to size with the carbon arc torch. Filler material was ordinary cast iron rod employed for gas welding purposes. A steel template is usually made up to sheet metal, and the worn wobbler ends are brought up to template size, and can be checked during the welding operation. The welds were hard enough to give good wearing life without spalling in service.

Preheating of the base metal for metallic arc welding is not required. However, a hard zone adjacent to the weld area will occur if preheat is not used. All electrodes for welding cast iron, whether ferrous or non-ferrous, will produce a high hardness in the heat-affected zone. With preheats of 500°F or over, there is a marked reduction in the hardened area adjacent to the weld, thus reducing the danger of cracked welds, especially on castings that offer restraint to the weld while cooling.

However, with the nickel steel type of electrode, welds are soft, can be machined, and the hardened area near the weld is very narrow, especially when low currents and small diameter electrodes are used. It can be machined on cast iron that has not been preheated. There is also less tendency for this deposit to crack off. Repairs are now being made that were not possible with the old ferrous or Monel types of electrode so widely used in the past.

The neck of one roll was badly galled and worn ventional measuring devices as tool makers It was preheated to 450°F and nickel steel was applied over the entire bearing surface to a thickness of ⅛ or 5/32 in.

The entire surface was coated with nickel steel, prior to the application of medium carbon steel. The nickel steel forms a good bond to the cast iron and bonds readily with the medium carbon steel. After the medium carbon steel had been applied, the roll neck was ready for the machine shop. About ten roll necks have been repaired in this way with excellent results.

There are any number of possible uses for the nickel steel type of rod on cast iron repairs or for building worn surfaces back to size. However, they do not offer a cure-all, and care should be exercised in their use. Although tensile strength of deposited metal is not too high, the rods can be used in conjunction with other types of rods.

Floating Bearings Minimize Vibration

A NEW type of bearing has been designed to eliminate vibration by allowing the shaft to rotate about its axis of inertia. The shaft makes no contact with the bearing, being supported entirely by fluid pressure. This condition can be maintained, even when the shaft is stationary if the fluid is pressurized by an independent pump.

The interior of the bearing has recesses and grooves as shown in fig. 1a. The recesses are fed with lubricant under pressure and this lubricant escapes along the grooves as shown in fig. 1b. If the shaft is displaced toward one recess, the area through which the fluid can escape from that recess will be reduced and the pressure in it will increase. Conversely, the pressure in the opposite recesses will decrease. Thus, any displacement produces a change in the lubricant pressure distribution, which returns the shaft to the central position, stabilizing the equilibrium.

Fig. 1b shows a bearing for a shaft subjected to loads varying in magnitude and direction. Fig. 1c shows an arrangement for a shaft under constant load. The lower recesses in fig. 1c are fed with lubricant under pressure and each of the lower grooves, A, B, C, and D communicates with the opposite recess by the orifices, a, b, c, and d, respectively. The lubricant finally escapes along the upper grooves. If the shaft is displaced toward an upper recess, the pressure there will increase, because the area of escape is reduced and the area of supply (the lower groove) is increased.

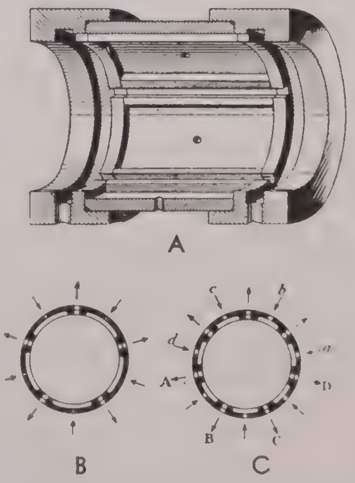


FIG. 1—The lubricant grooves and ports of the floating bearing are shown in a, while b shows the design for a shaft subjected to loads in varying magnitude and direction and c shows the design for a shaft under constant load.

In a spindle grinder fitted with two bearings of the type shown in fig. 1b, using water at 70 psi as a lubricant, the spindle was run for 50 hr without wear at speeds in the region of 18,000 rpm. Shaft diameter was 1 3/16 in., with about 0.001 in. play between the shaft and the bearings and an exaggerated overhang of 4¼ in.

The bearing was described by M. Paul Gerard in *Comptes Rendus*. Three other sets of bearings have been run, and an experimental model has been run with compressed air as a lubricant. In general, the expenditure of energy in compressing the lubricant is justified by the reduction in frictional loss.

How to Make Best Use of

The use of gage blocks in precision measurement of machined parts is greatly enhanced by the use of such accessories as the sine bar, surface plates, master flats, master squares, base blocks, adjustable holders, caliper bars, trammel points and similar items. The use of these accessories and their limitations, typical applications, and the accuracy of such accessories are discussed by the author.

FIG. 1—Accuracy of flatness of a surface plate must be within 0.0003 in. if it is to be used directly or indirectly with gage blocks.

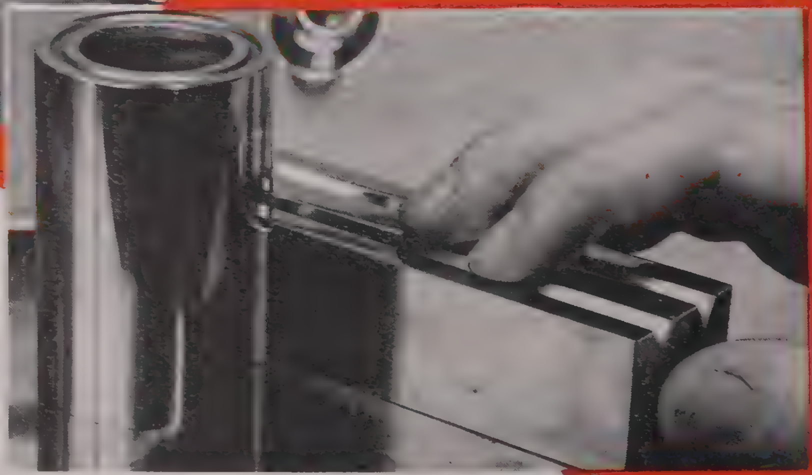


FIG. 2—The accuracy of this comparator gage anvil is being checked by a master flat and master square. These two accessories jointly represent the most precise 90° angle possible.

WITH the increasing demand for precision in machined parts, the value of gage blocks can be appreciated only if the user has at least a basic understanding of related precision accessories. Gage block accessories can be classified in two distinct groups. The first group consists of truly precision instruments in their own right, and can be effectively used with or without gage blocks. The second group provides a variety of made-up precision measuring instruments inseparable from gage blocks for their functioning. One accessory, the sine bar, is necessarily a part of both groups, but in this discussion it is classified in the first grouping.

Because of their nature and other various factors, gage block accessories do not incorporate a precision equal to that of *laboratory* grade blocks. Their use is therefore limited to *inspection* and *working* quality blocks, which are directly related to production. The fact remains that all accessories are finished to the highest degree of accuracy scientifically possible to coincide with and safegard the accuracy of the blocks with which they are used.

Most commonly used and included in the first classification are such accessories as the surface plate, master flat, master square, and sine bar.

The flatness accuracy of a surface plate varies as does its working area, and considered in this article is the surface plate intended as an auxil-

Gage Block Accessories

By H. J. CHAMBERLAND
Springfield, Mass.

iary to the master flat for precision measurements not within the capacity of the latter. Assuming that the plate is made of selected close grain iron and completely stabilized, its surface is nevertheless one that is scraped rather than lapped. If gage blocks are to contact such a surface, directly or indirectly, specifications call for a flatness accuracy within 0.0003 in. Such flatness is far from one of optical quality, but it does permit the direct use of gage blocks as in fig. 1.

It is highly important to maintain the original accuracy of the surface of the plate by giving it proper care and, particularly, not bringing it in contact with surfaces of an inferior finish. The 0.0003 in. accuracy of flatness is verified with gage blocks previous to the delivery of the plate and can likewise be checked as often as necessary by the user. This inspection procedure is simple. Three accurate gage block combinations of identical height are used with the longest straight edge available. The combinations are positioned on the surface plate for the straight edge to rest from its ends and center, and any low spot can then be readily determined by the feel of any one of the combinations as the setup is moved to various points of the surface. A dial indicator gage graduated in tenths can also serve a similar purpose, providing the bottom of its base has a desirable accuracy of finish.

The master flat is by far a more precise accessory than the surface plate because the top surface of the master flat is lapped and held within limits of 10 micro-inches per sq in. to 3/16 in. of the edge. Standard dimensions of the master flat are 5 x 7 x 1⅛ in., with sides and bottom surface ground to a commercial finish. Gage blocks may actually be wrung to its lapped surface, which explains why gage blocks and optical flats are used to test the accuracy of master flats in the course of manufacture or when returned for reconditioning.

A [illegible] master flat is a base designed for gage

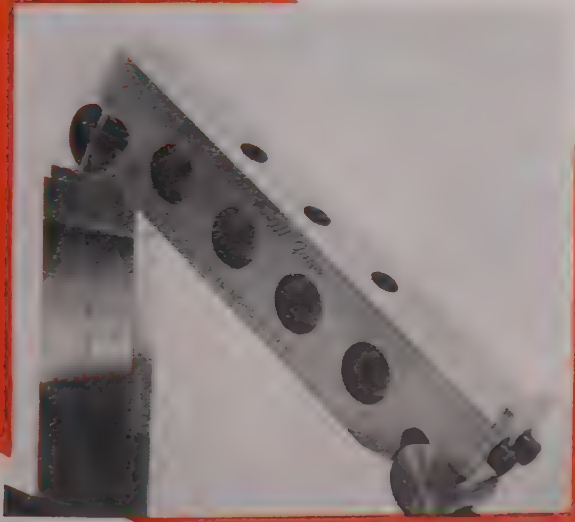
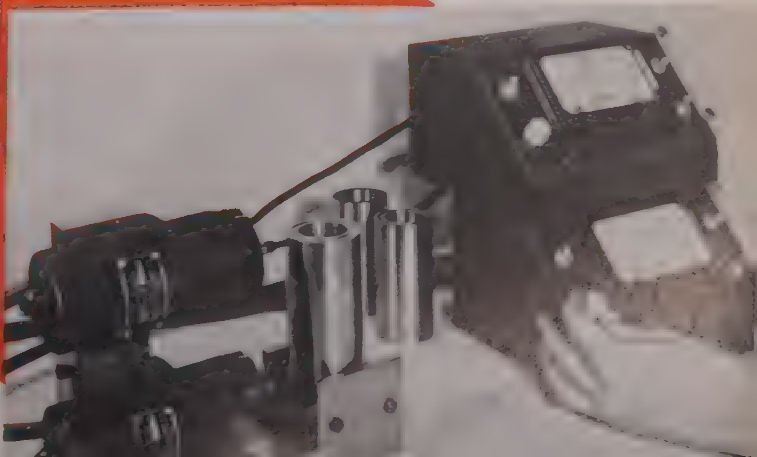


FIG. 3—The sine bar, master flat and proper gage block combination provides an angle of setting accurate within 2 sec of arc.

FIG. 4—Checking accuracy of master squares with "super" master square requires two comparator gages of the electronic type.



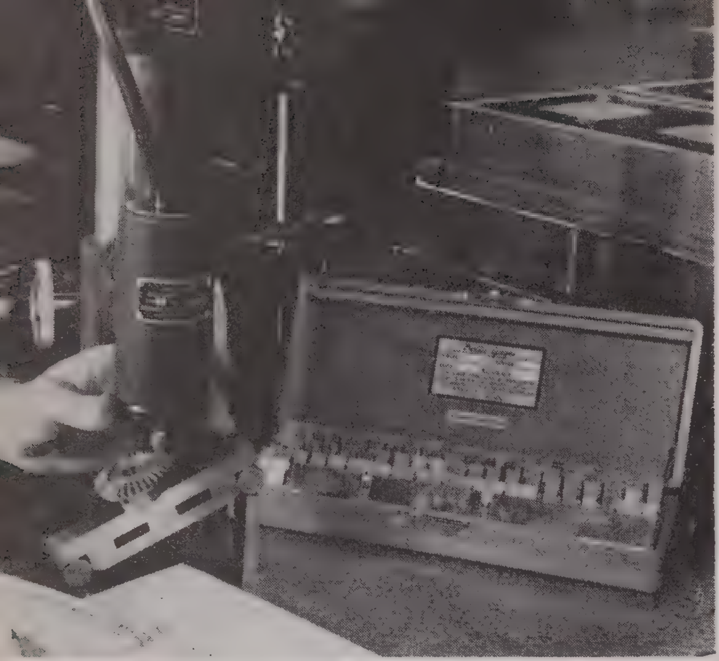


FIG. 5—The sine bar can be used for inspection of short run production. Here, a bevel gear is being tested with a sine bar and a precision surface plate that was substituted for a master flat.

blocks and related instruments, its accuracy should be maintained and extended by diverting all measurement applications possible to a high precision surface plate. However, because of the eventual dire results of starting extremely fine measurements from a plane that is not optically true, the need for a master flat and its possible range of applications cannot be ignored. Two of its most frequent and practical uses are in connection with the master square and sine bar shown respectively in figs. 2 and 3.

The master square and master flat combine to provide a 90° angle that is accurate within 5 sec of arc. Such means are indispensable for periodically checking components of specialized instruments such as comparator gage anvils or conventional measuring devices as tool makers' squares and numerous other items in the modern plant. For maximum efficiency, the master square should be sleeve-like with a substantial wall thickness and measure 4 in. long x 2 in. diam. The original precision of a master square may be maintained for a long time if both ends are marked so the same one is used until it shows signs of inaccuracy in comparison with the unused end. Shop-made master squares, and there are some very accurate ones, are not truly *masters* if the dual comparator gage setup shown in fig. 4 is accepted as one of the few scientific means devised to micro-check the straightness of the instrument.

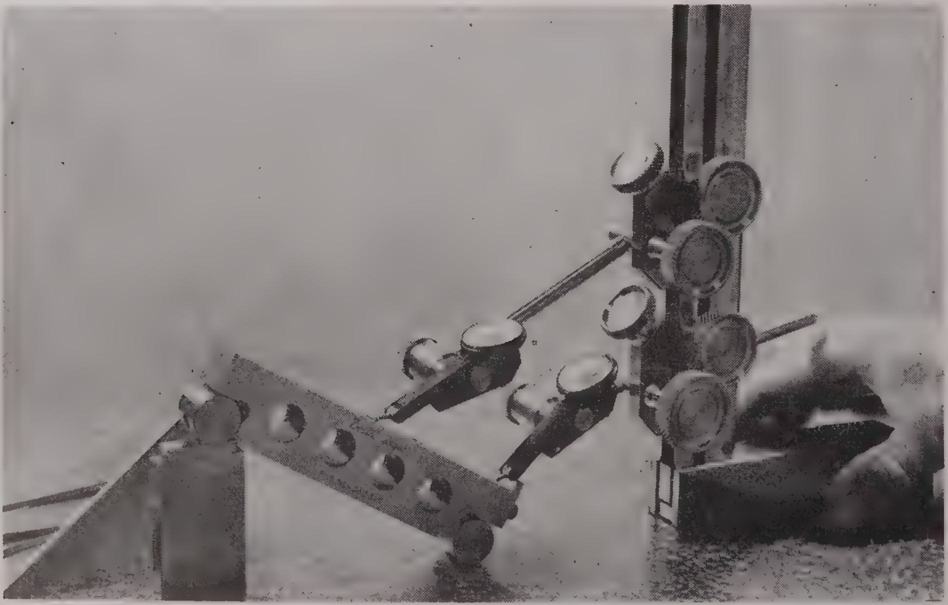


FIG. 6—Having set the sine bar to the required angle, with the proper gage block combination, the measurement is reproduced for quantity inspection.

The sine bar takes over where and when the vernier type of bevel protractor must leave off, because the setting or verifying of angles, bevels and tapers in terms of 1/12th of a degree is positive only when determined with a sine bar. Formerly rated as laboratory equipment, the sine bar eventually had to follow gage blocks in their invasion of modern production lines. As previously stated, it is worthless without gage blocks and is most effective only when used in connection with a master flat. The style, shape or length of a sine bar is immaterial, as these are subject to identical use and principle so it leaves accuracy as the only important factor.

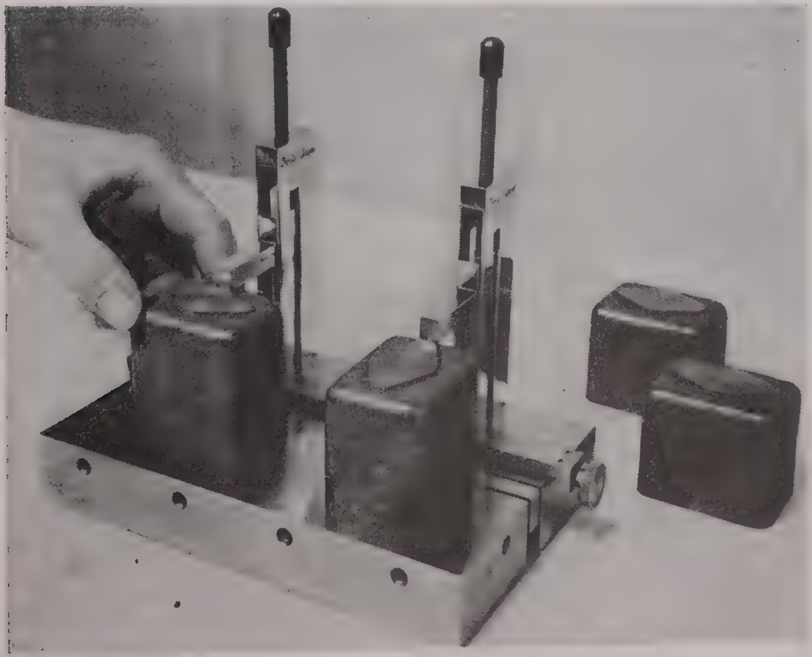
There are shop-made sine bars, the precision of which compares favorably with that of shop-made master squares. The fact remains that the sine bar is the *master* of the vernier protractor and is therefore subject to some established standards of precision. A widely used design of sine bar, shown in fig. 3, is 5½ in. long with centers of rolls 5 in. apart. The face of bar is parallel to the bottom of the rolls within 0.000025 in., flatness is within 0.000050 in. between the 5 in. dimension, and the nominal size between the centers of the rolls is ±0.000050 in.

Mention of the sine bar naturally brings to mind the reducing of all angles to terms of a right triangle. This is the simplest of all trigonometrical solutions, but still out of line with the relatively more comprehensible data on the use of gage blocks and other accessories. However, the most common problem encountered by the tool or die maker, machinist and floor inspector is to determine or check an angle between the hypotenuse and the base. This is where the sine bar, and simple trigonometric formulae available in most books on machine shop practice, simplify matters tremendously.

A right triangle consists of three sides, the hypotenuse, base and perpendicular or altitude. The sine bar is always the hypotenuse of a right triangle and the length of this side is therefore always a known number, which in this case is 5 in. Knowing the height, or readily determining it by building a gage block combination to equal it, the angle is readily solved. Tables of sines of the 5 in. bar, or longer ones, are in terms of the height or the side. Figures giving the corresponding angle of a known height or perpendicular only have to be reversed to determine the perpendicular or side of a known angle.

Since the sine bar and master flat form a combination for highly precise measurement, their use as with the master square should be reserved exclusively to find or verify the accuracy of angles in terms of a few micro-inches. For the inspection of parts in quantities, this form of measurement would serve only as a *master* to locate and clamp a parallel bar to a precision angle face plate and this assembly would in turn be transferred to a surface plate. However, the sine bar is often used on a surface plate for the inspection of short production parts, as in fig. 5.

There are parts encountered in the course of precision inspection which, because of bosses, projections and other factors of interference, cannot directly be placed in a master flat or surface plate. These require the use of precision parallels, preferably of the master type. Most

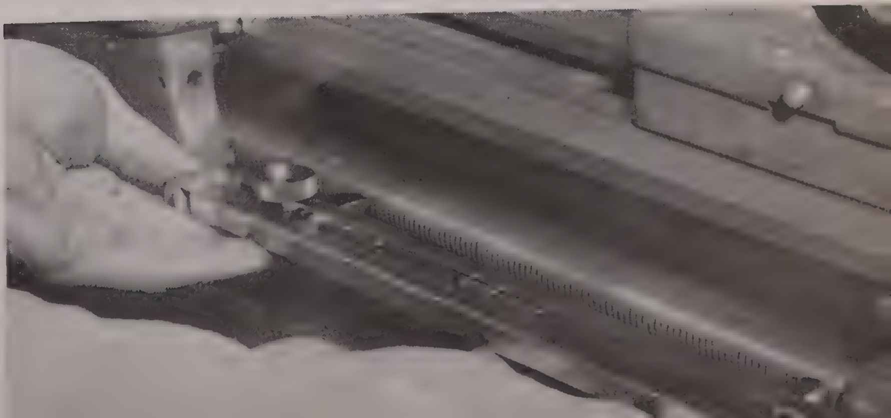


° ° °

LEFT

FIG. 7 — This assembly consisting of an especially made base block, holders, caliper bars and proper gage block combinations, provides an economical setup to accelerate quantity inspection.

° ° °



RIGHT

FIG. 8—The lead of this lathe screw thread can be checked in terms of microinches with an instrument readily made with 12 in. holder, the proper gage block combination and trammel points.

significant in the use of parallels is that they be precisely matched and permanently kept that way. Master parallels may vary in size, but flatness of the working surfaces should be within 0.000005 in. Working surfaces as represented by thickness and length with parallelism should be held within 0.000004 in. Variation in size should not exceed 0.000020 in. Because master parallels may be wrung to a master flat, in this respect they incorporate the same precision as gage blocks to adhere firmly and thereby minimize what could amount to substantially micro-inch height errors.

Comprising the second group of accessories, intended for instrument assemblies, are the following: Base block; adjustable holders, 2, 6, 9 and 12 in.; caliper bars, ⅞ in. and 3 in. extension; trammel points; center points; and scribers. The base block is not always used, but the adjustable holders are indispensable in connection with all other accessories mentioned.

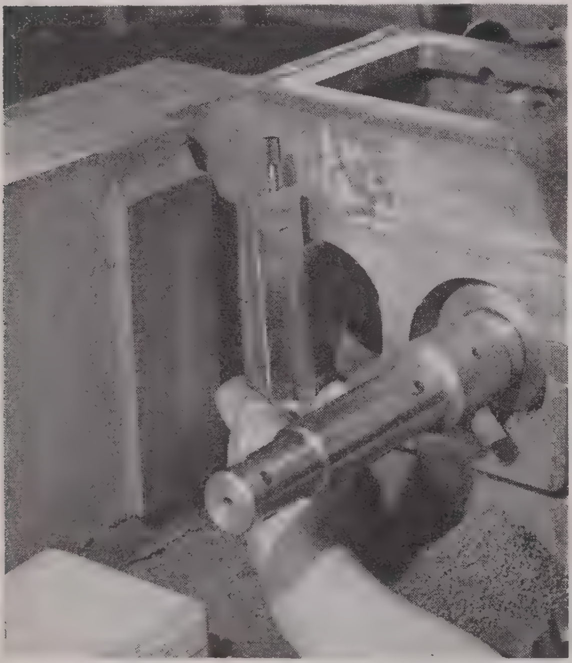


FIG. 9—The size of this bore in a casting is being verified with an internal gage made as that shown in fig 8, except for substituting trammel points with the short caliper blocks, which are intended for internal as well as external measurements.

Figs. 6, 7, 8 and 9 show several of hundreds of applications for this group of accessories to derive in excess of 100,000 measurements in steps of 0.0001 in. and within an accuracy not permissible by any other means.

Depending on the nature of the work involved, all accessories in this group are not always required, but their total cost is so reasonable that no item should be excluded. Briefly, there are several prime functions of the assemblies. A straight line may be drawn by using the base block, proper gage block combination and scriber in the proper gage block holder. Thus, parallel lines may be drawn by varying the gage block combination accordingly. Substituting the large or small caliper block for the scriber provides the height gage. Substituting the other mating caliper block for the base block provides a *Go* or *No-Go* snap gage. Likewise, a *Go* and *No-Go* can be made by combining the long and short caliper blocks into one holder. Substituting the center points for the caliper blocks provides the fastest and most accurate means to check screw threads. Arcs or circles of micro-inch precision can be drawn by a center point and scriber assembly, with similar precision applying to the use of trammel points for layouts.

The effectiveness of these accessories can better be realized with a knowledge of their respective specifications as compared to that of the gage blocks.

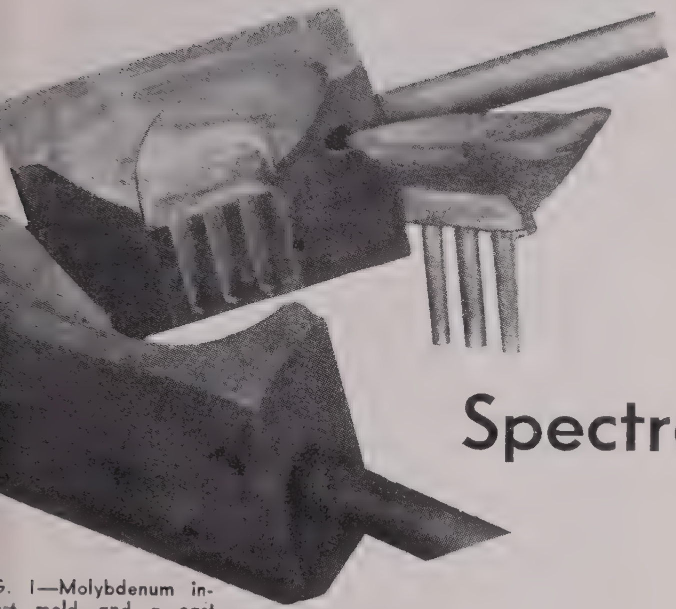
Base Blocks:	Nominal thickness of 1 in. held to ±0.000025 in. Flatness of top surface held to ±0.000005 in. and bottom surface to ±0.000010 in.
Holders:	Secured to base block by means of single point bearing to prevent misalignment of blocks.
Caliper Bars:	Flatness on width held to ±0.000005 in.
Center Points, Trammel Points, and Scriber:	Flatness of the bottom surface held to ±0.000005 in. per in. of length and to ±0.000005 in. of total width.

It is obvious that when using a combination of gage blocks, the combined precision of all parts involved can be rendered worthless by improper handling or care of the blocks and improperly wringing them into combinations. These requirements although often repeated are not always put in practice. Cleanliness is the prime requisite. The blocks should always be wiped before using, preferably with clean chamois and carbon tetrachloride to remove the acid free petroleum jelly which should always be used to grease them after use. The measuring surfaces of the blocks should never be touched to avoid finger mark corrosion that is likely to increase the dimensions. The blocks should be carefully wiped with and placed on cleaning tissue previous to wringing.

No one ever discovered why gage blocks adhere with a force approximately six times that of atmospheric pressure when correctly wrung together. The soundest reason for the phenomenon appears to be molecular attraction and the subject even goes into electrons. The fact remains that it does happen.

The first step for wringing two blocks together is to have clean hands. Next, the surfaces to be joined should be wiped across the ball of the hand, which in the language of gage blocks, is called *oiling*. They are now ready to be wrung by grasping them at the ends between the thumb and forefinger of each hand; then contacting the surfaces to be wrung about ⅛ in. from the corners in the most parallel position possible. One of the blocks can now be slid forward in a continued parallel motion and a slight inward pressure until the gages are properly aligned. Block after block can thus be added by following these simple recommendations.

The author is grateful to the DoAll Co., for its cooperation in the preparation of this article.



G. 1—Molybdenum in-
rt mold and a cast
ple of the type used for
ectrographic analysis.

Moly Mold Samples Increase Accuracy of Spectrographic Analysis

◦ ◦ ◦

By HENRY A. TUTTLE
and
FORD R. BRYAN
Process Engineering Laboratory,
Ford Motor Co.
Dearborn, Mich.

◦ ◦ ◦

The axiom that an analysis is only as good as the sample applies to any material — perhaps particularly to cast iron and cast steel. For these metals, the authors report that by casting samples in a molybdenum insert mold, spectrographic analytic deviations have been cut to as little as one-third of the variance experienced with samples from iron molds.

ONE of the most important problems in the routine spectrographic control analysis of cast iron and cast steel is the obtaining of representative samples. A recent advance toward the solution of this problem has been made at the Rouge Plant of Ford Motor Co. by the use of a molybdenum insert mold for the casting of rod samples for the laboratory.

Spectrographic samples obtained with this mold show a greater uniformity of structure, resulting in considerable improvement in the precision and accuracy of analytical results.

The original reason for the construction of the mold was the durability molybdenum showed as a mold material during nine months successful use in preparing furnace samples of stainless steels cast at full furnace temperatures.[1] However, as the test results were compiled, it became apparent that the improved quality of the sample was of equal or even greater importance than the life of the mold. It is not yet known why molybdenum is preeminently suited for use as a permanent mold material.

Numerous sampling techniques have been tried in the past. A technique in which the molten metal is drawn into a pyrex glass tube by means of suction has been successfully employed for some time at Ford for sampling

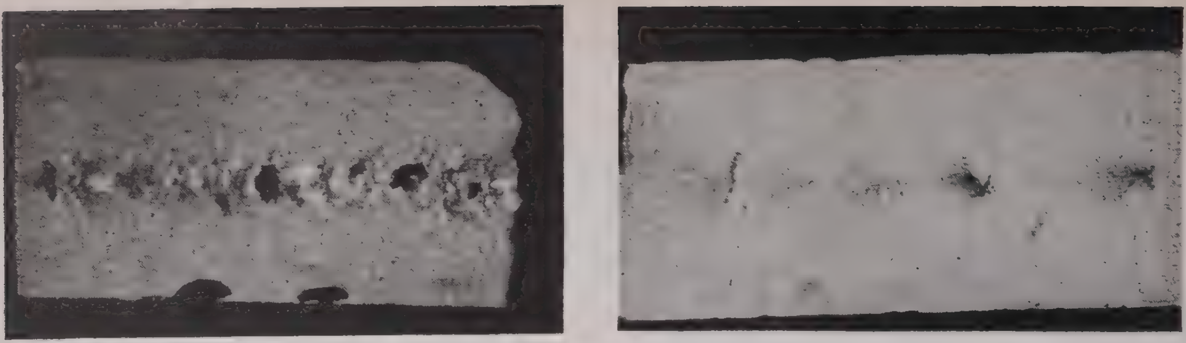


FIG. 2—Photomacrographs of longitudinal sections of pin samples showing the comparative shrinkage. The piece showing heavy shrinkage (at left) was cast in a standard iron mold and the other in the molybdenum mold. Nital etch; 6X; reduced a half in reproduction.

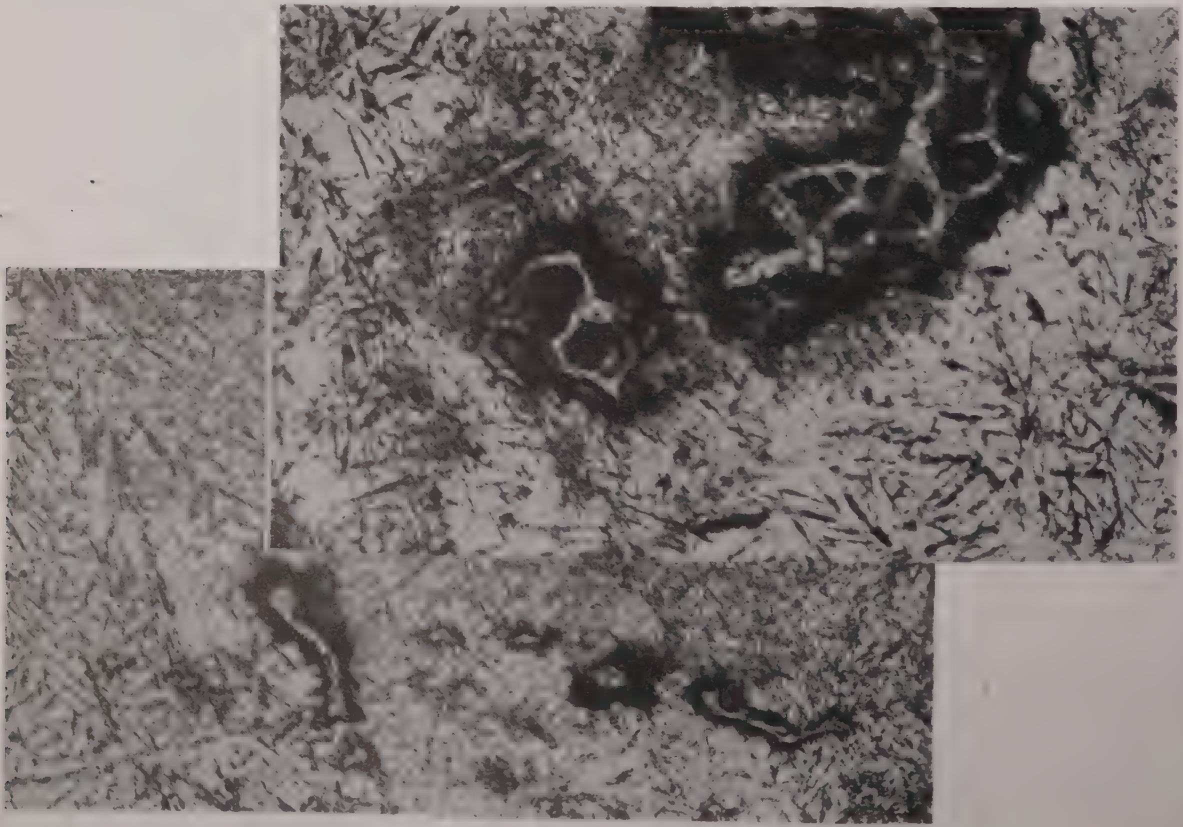
alloy steels for spectrographic analysis. But this practice has not been satisfactory for sampling cast iron and cast steels of high carbon content, as in casting such samples at full furnace temperature, a layer of glass often fuses to the pin and results in silicon contamination and impaired electrical conductivity. Also, it has proved difficult to obtain samples on a routine basis with uniform structure. Sand molds and cast iron molds have been used quite extensively, but have afforded only a compromise to the problem.

The new mold is designed to provide a pure molybdenum metal insert into which the molten metal flows in the casting process. Vacuum-melted and cast molybdenum metal is now being produced experimentally by the Climax Molybdenum Co. of Michigan, which supplied the material for the test mold. Fig. 1 shows a view of the mold with the molybdenum insert after about a thousand samples had been taken. A cast sample with the three pencil rods used for spectrographic analysis is shown in the photograph. The body of the test mold was reworked to receive the molybdenum insert.

Figs. 2 and 3 have been taken from a metallographic report comparing longitudinal sections of typical samples cast in the conventional cast iron mold and in the molybdenum mold. The photomacrographs show a comparison of the extent of shrinkage found in the two types of samples, and the photomicrographs illustrate the finer and more uniform grain structure of the samples cast in molybdenum. This improvement in structure was further substantiated in radiographs of a number of cast pins from each type of mold.

The improvement in the general structure

FIG. 3—Photomicrographs show comparative martensitic structures. The sample with heavy shrinkage (top sample) was cast in an iron mold and the sample with light shrinkage (lower specimen) in the molybdenum mold. Nital etch; 1000X.



and uniformity of samples cast in the molybdenum mold results in a pronounced improvement in the precision and accuracy of spectrographic results. One specific test involved the spectrographic analysis of phosphorus in cast iron.[2] A number of samples containing 0.045 pct P were obtained both from a cast iron mold and from the new molybdenum mold. The sample from a cast iron mold, when analyzed 15 times, showed an average deviation of 0.006 pct P, with a maximum deviation of 0.015 pct P. A sample cast in the molybdenum mold and analyzed under the same conditions showed an average deviation of 0.002 pct P, with a maximum deviation of 0.005 pct P, or about one-third that experienced with samples from a cast iron mold.

Acknowledgement is made to V. Crosby, Climax Molybdenum Co. of Michigan, for suggesting the use of molybdenum permanent molds and for furnishing the material for the original test mold.

At the time of this report, over 2000 samples have been cast in the molybdenum mold with no appreciable change in the physical appearance of the mold or the quality of the cast samples. It is believed that the life of such a mold will be far in excess of that obtained with conventional types, especially when used for samples cast at full furnace temperature.

Additional tests and extended applications of molybdenum molds for casting samples are being made. Although the cost of the experimental cast molybdenum is somewhat higher than standard mold materials, the improved sampling and the extended life of the molybdenum mold are expected to more than compensate for the initial cost.

REFERENCES

[1] Private communication from V. Crosby, Climax Molybdenum Co. of Michigan.

[2] F. R. Bryan and G. A. Nahstoll, "Industrial Application of Geiger-Muller Counters to the Analysis of Phosphorus in Steels," J. Optical Soc. of America, 38, 610-17 (1948).

Measuring Creep with Strain Gages

MEASUREMENT of creep in test specimens by means of SR-4 bonded resistance wire strain gages rather than the conventional extensometer gives simple, accurate and sensitive measurements, according to a report of the Canadian Bureau of Mines.

Gages can be applied to more than one area of the specimen, and, in some instances, permit the use of test pieces of more convenient dimensions than required in extensometer measurements.

Experimental tests, all at room temperature, were made with two type A-3 gages made by Baldwin Locomotive Works, bonded longitudinally on opposite sides of the gage length of specimens. The specimens were machined from sand castings of a magnesium alloy, and had an overall length of 12 in., parallel gage length of 10 in. and a diameter of 0.505 in. Conventional lever arm creep machines were used.

Strain gage measurements were checked against a mechanical extensometer system, and comparative data by the two methods are graphed in the elongation-time curves in fig. 1. Discrepancies between the two curves were attributed to movement of adapters in the extensometer during test. The fact that the discrepancies were approximately constant in terms of percent elongation supports this conclusion. It should be noted that the strain gage data make a smoother curve than that obtained with the extensometer.

Room temperature variation was not under rigid control, but the fluctuation was less than ±3.5° from 70°F.

Creep loads of 6500 to 15,000 psi were applied gradually over a period of several minutes, elongation readings being taken immediately before and after applying the load in order to establish the initial deformation. Tests lasted 1000 hr and periodic readings were recorded to define strain vs time or creep curves. In some instances pre-stress loads were applied after equilibrium conditions were reached in the creep machine. These loads were applied gradually over a period of several minutes and then slowly removed. Creep loads were applied immediately after removing the pre-stress loads.

Since the tests constitute only a preliminary study, the report emphasizes that the data indicate only the possibility of using the gages for creep measurement and are not proof that room temperature creep can be measured under all conditions by this technique. Further experimental work is recommended to ascertain SR-4 strain gage behavior under conditions of constant stress at room temperature.

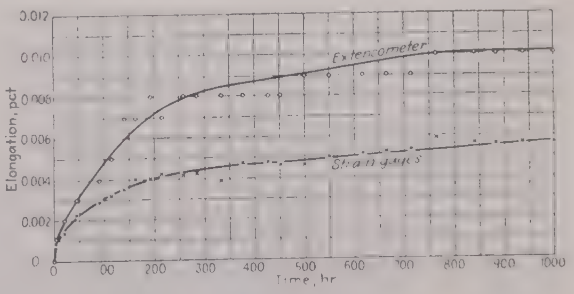
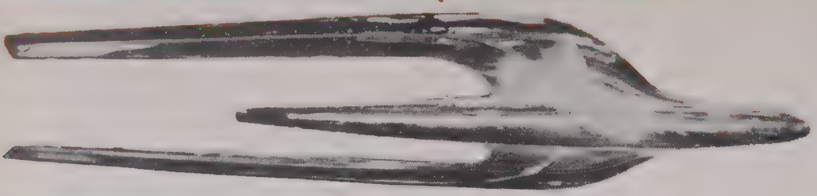


FIG. 1—Room temperature creep data taken with both SR-4 strain gages and an extensometer. Pre-stress was 9000 psi and creep load 6500 psi.



Gold and

By W. A. HOPKINS
Manager, Holly Plant,
Continental Die Casting Corp.,
Div. of F. L. Jacobs Co.,
Holly, Mich.

DESIGNERS have been attracted by the possibility of combining gold and chromium plates in the same part for some time. A number of nameplates, radiator ornaments for automobiles and similar parts have been done in gold and chrome by assembling two separately finished parts. The desired effect has been somewhat lost in breaking the piece into joined segments, however, and the cost of separate finishing and assembling has run quite high in comparison with one-piece work.

The designers of an automobile radiator ornament desired a one-piece diecast part plated in a combination of gold and chromium. A process, involving the masking of the area to be gold plated during the chromium deposition, was developed at the Holly, Mich., plant of Continental Die Casting Div. of F. L. Jacobs Co., with Bart Laboratories, Inc., Belleville, N. J., assisting in the development.

Since starting production, over 18,000 parts have been finished by the method and the technique has settled into a routine production-line process.

The established procedure for plating zinc base diecastings is followed through the bright nickel plating step. Castings are first polished to remove parting lines and surface imperfections and are then automatically buffed on reciprocating type machines. After inspection, the parts are racked and put through the following plating cycle:

(1) Soak in Dykasol solution, 40 sec at 140°F; (2) rinse; (3) pressure spray in mild alkaline cleaner, 2 oz per gal at 175°F, for 2 min; (4) rinse; (5) anodic electroclean in alkaline cleaner, 6 oz per gal, 30 sec, 180°F, 6 v; (6) double rinse; (7) acid dip in H_2SO_4, 3 pct by volume; (8) rinse; (9) copper strike, 1 min, 170°F, 4 v; (10) copper plate in du Pont High-Speed bath with

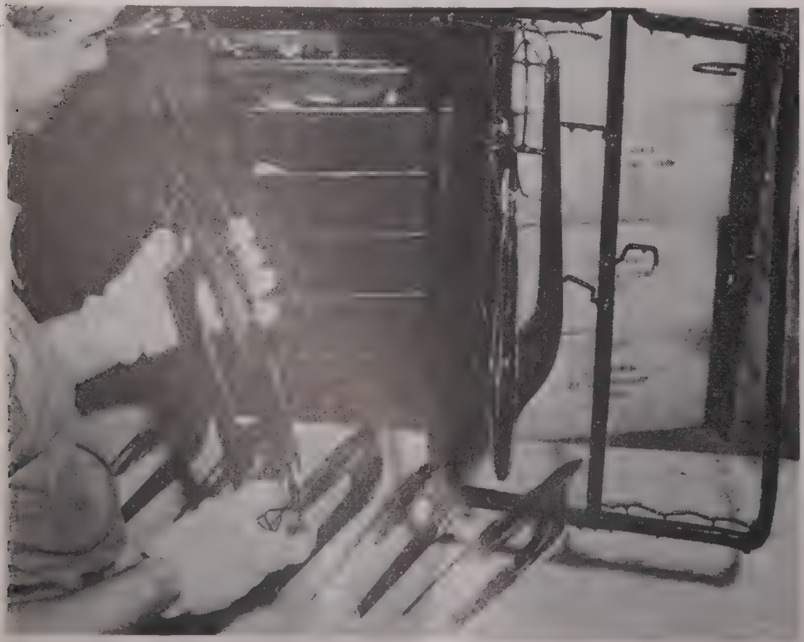


FIG. 1—Metal and plastic masks, held securely in place by wire, are bridged across the area of the piece which will later be gold plated. The masks protect this area while the remainder of the surface is chrome plated.

Chromium Combination Plating

A process for plating both gold and chromium on the same part, to give a highly decorative two-color piece, is described by the author. The area of the base nickel plate to be gold plated is masked during chrome deposition. Then the entire part, unmasked, can be gold plated since the gold will adhere to the nickel surface but not to the sections already covered with chrome.

periodic current reversal, 180°F, 30 min at 30 amps per sq ft; (11) rinse; (12) anodic alkaline clean, 30 sec at 160°F, 6 v; (13) rinse; (14) acid dip in H_2SO_4, 10 pct by volume; (15) rinse; (16) bright nickel plate, 36 min, 150°F, 40 amps per sq ft; (17) double rinse.

Up to this point the process has followed the conventional procedure. Now, before chromium plating, the casting is carefully masked, with the metal and plastic fixture as shown in fig 1, to cover the area which will subsequently be gold plated. Then the process continues as follows: (18) Activate in NaCN solution cathodically; (19) rinse; (20) acid dip in H_2SO_4, 5 pct by volume; (21) rinse; (22) chrome plate in sulfate bath containing 40 oz per gal CrO_3, sulfate ratio 100 to 1, 110°F, 3 min at 100 amps per sq ft; (23) double rinse.

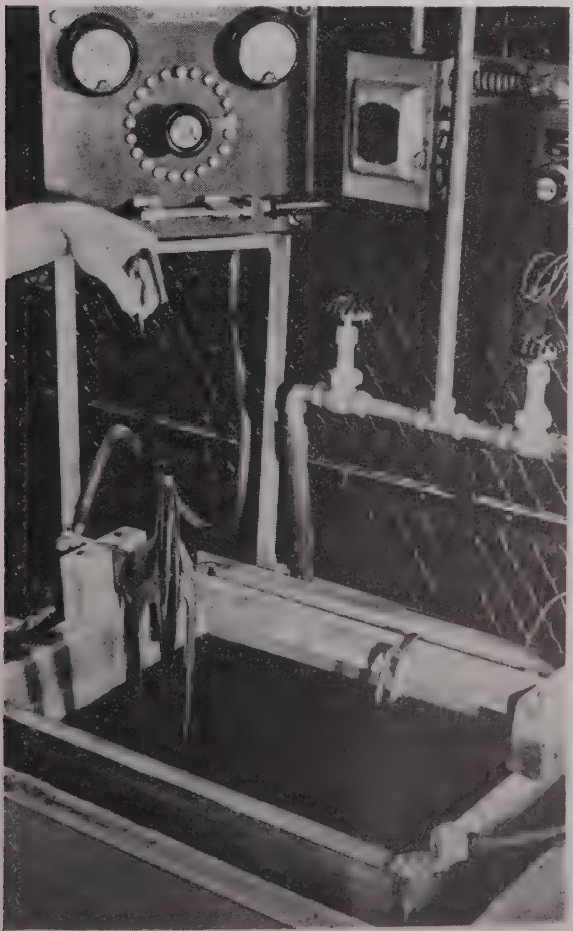


FIG. 2—Parts, with the masks removed, are gold plated. Gold will not adhere to the areas which have previously been chrome plated.

The mask is then removed and the part is carefully color buffed on the area which was masked. This is necessary to remove oxidation film from the nickel surface. The part is then ready for gold plating and the process continues:

(24) Cathodic electroclean in nickel alkaline cleaner, 180°F, 5 oz per gal. 4 v, 45 sec; (25) rinse; (26) acid dip in H_2SO_4, 2 pct by volume; (27) rinse: (28) gold plate in potassium-gold cyanide bath, as shown in fig. 2; (29) double rinse.

After removal from the final rinse tanks the parts are carefully wiped with a soft cloth to remove loosely adherent gold from the chromium plated surface. The gold surface of the part is sprayed with a clear baking enamel, as in fig. 3, and the casting is baked at 250°F for 45 min. As the final operation, the pieces are studded and packed for shipment.

BELOW

FIG. 3—Gold plated portion of the part is sprayed with a clear enamel. Painting mask covers the chrome surface.

Colorimetric Determination of Copper

Details of a procedure for the rapid determination of copper in tin and lead base alloys are given by the author. The technique is reported to be faster than the commonly used methods, with single analyses requiring 20 min. The results of test runs on Bureau of Standards samples are summarized to demonstrate the precision of this method.

THE need of a rapid method for the determination of copper in tin and lead base alloys is of prime importance, as the commonly available methods are not both accurate and speedy.

Any procedure depending on a sulfide separation is too long and complex to be adopted as a routine procedure for laboratory technicians. The ASTM electrolytic method[1] where the tin, antimony and arsenic are volatilized by the use of hydrobromic-bromine mix, although an improvement over the methods using alkali sulfides, still suffers certain shortcomings. This second procedure cannot be used indiscriminately for the wide range of alloys the chemist has to analyze. In addition, the electrolytic determination is time consuming and only in special alloys does one plating yield a clean, bright copper plate suitable for weighing. Silver and bismuth if present will plate out with the copper, requiring corrections, and many times when antimony is high, the plate comes out dark and must be replated. For low amounts of copper a large sample, difficult to work with, must be used to obtain any degree of accuracy.

TABLE I

Accuracy of Determinations by the Proposed Procedure on Bureau of Standards Specimens.

Sample	Sample Weight	Cu Present, Basis of 5g	Cu Found
53b	0.5g	0.209	0.21 0.207 0.21
	0.25	0.1045	0.107 0.105 0.11
	1.0	0.418	0.42 0.42 0.42
54a	0.5[1]	3.75	3.75 3.78 3.75
	0.1	0.75	0.76 0.76 0.75
127	0.5[2]	0.014	0.012 0.012 0.015

[1] Dilution to 500 ml and color developed on 2 ml portion.
[2] Color extracted from 25 ml portion with CCl_4.

The nitric-HF procedure[1] for low lead alloys suffers from the same disadvantages as the hydrobromic-bromine method.

The colorimetric sodiumdiethyldithiocarbamate procedure for copper[2] seemed to offer the best possibility for a rapid procedure; and, working from it, a method has been developed by which determinations, as accurate as by any other standard procedures, can be carried out in about 20 min. The only elements other than copper which form colored compounds with the reagents are bismuth, iron, manganese, nickel and cobalt. Of these, manganese, nickel and cobalt are rarely found in the white metal alloys.

Manganese, if present, does not interfere in the ammoniacal citrate solution in which the determination is made. Nickel, if present, can be precipitated by a few drops of dimethygloxime solution before the addition of the color reagent and then centrifuged out. If cobalt is present in sufficient quantity to interfere, a sulfide separation can be made.

In the alloys, bismuth is commonly found both as an impurity and as an alloying element, and iron will often be present as an impurity. Iron, like manganese, does not interfere in ammoniacal citrate solution, and although bismuth forms a color similar to copper, the color is much less sensitive and under the conditions of the determination, bismuth under 0.50 pct will not affect the accuracy. If present in greater than this percentage, another aliquote to which KCN solution is added[3] is run along with the copper. The copper color will not develop in this medium and any color present will be due to bismuth so that the element can be corrected for.

Table I shows results obtained by the use of the method on U. S. Bureau of Standards sam-

in Tin and Lead Base Alloys

◦ ◦ ◦

By MILTON SHERMAN
Chief Chemist,
Silverstein & Pinsof, Inc.,
Chicago

◦ ◦ ◦

ples of known percent copper. Table II gives instructions for the preparation of the required reagents.

Procedure

The proposed procedure for the determination is as follows:

(1) Transfer 0.5 g drillings or shavings of the sample to a 125 ml flask.

(2) Add 10 ml HBr-Br_2 mix and raise to a boil.

(3) Digest on moderate heat for about 2 min.

(4) Cautiously add 5 ml H_2SO_4 and take to strong fumes over a Meeker burner.

(5) Let stand until cool and add 25 ml cold H_2O. Raise to a boil and cool in running water to room temperature.

(6) Filter through filter paper containing pulp into a 100 ml volumetric flask. Wash out with cold water and dilute to the mark. Shake.

(7) Transfer exactly 5 ml to a 50 ml volumetric flask and add, in the following order, with shaking after each addition: 2 ml of 25 pct citric acid, 3 ml of NH_4OH, 5 ml of gum arabic solution and 10 ml of the sodiumdiethyldithiocarbamate solution. Dilute to the mark with water and read density or transmittance using a wavelength of 425 mu or a blue filter.

(8) Read percent copper from a standard chart prepared by standards from samples of known copper content.

(9) If bismuth is known to be present or is suspected, add the reagents, as in step (7) to another 5 ml portion, except that before the addition of the sodiumdiethyldithiocarbamate, 5 ml of the KCN solution are added. The density of this solution is then subtracted from that of the copper determination to obtain the true percent copper.

A more complete and rapid volatilization of the antimony, arsenic and tin results if the sample is digested prior to the addition of the H_2SO_4. For alloys containing over 50 pct Sn, it is best to digest the sample for about 10 min before the fuming is carried out, for if the volatilization is faulty, a cloudy solution might result when the color is developed. When cloudiness occurs, transfer another 5 ml portion to a separatory funnel, add the reagents as before, except that the gum arabic is omitted, and extract the copper with 50 ml CCl_4.

If the copper content of the sample is over 1.0 pct, either a smaller sample is used or the solution is diluted to a greater volume.

For copper less than 0.03 pct, develop the color on a 25 ml portion. Use 10 ml NH_4OH and omit the gum arabic. Extract with 25 ml of CCl_4 and divide the answer by ten.

Portions of the H_2SO_4 solution of the sample may be used for other determinations. Cadmium and zinc may be directly determined polarographically if there is less than ten times as much copper as cadmium or zinc. If the ratio of the copper to the impurities is too high, the bulk of the copper may then be plated out prior to the polarographic determination. Iron may be determined by the thioglycollic acid method[4], and aluminum by the thioglycollic acid and alizarin red S procedure[5]. In the iron and aluminum procedures, copper and other impurities that might be present will not interfere.

References

[1] ASTM Methods, Chemical Analysis of Metals (1946).
[2] T. Callan and J. A. R. Henderson, Analyst, 54,650 (1929).
[3] D. L. Drabkin, J. Assoc., Official Agr. Chemist, 22,320 (1939).
[4] M. Sherman, American Foundryman, 14, 6 (1948).
[5] To be published.

TABLE II

Preparation of Required Reagents

Hydrobromic-Bromine Mix—500 ml HBr and 50 ml Br_2.
Citric Acid—25 pct.
Ammonium Hydroxide—concentrated.
Sodiumdiethyldithiocarbamate—0.10 pct in H_2O. Keep in dark-colored bottle.
Potassium Cyanide solution—7 pct in H_2O.
Gum Arabic—To 1 g of powdered gum add 100 ml hot H_2O and boil while stirring until clear. Discard when precipitate forms on standing.
Carbon Tetrachloride—cp.

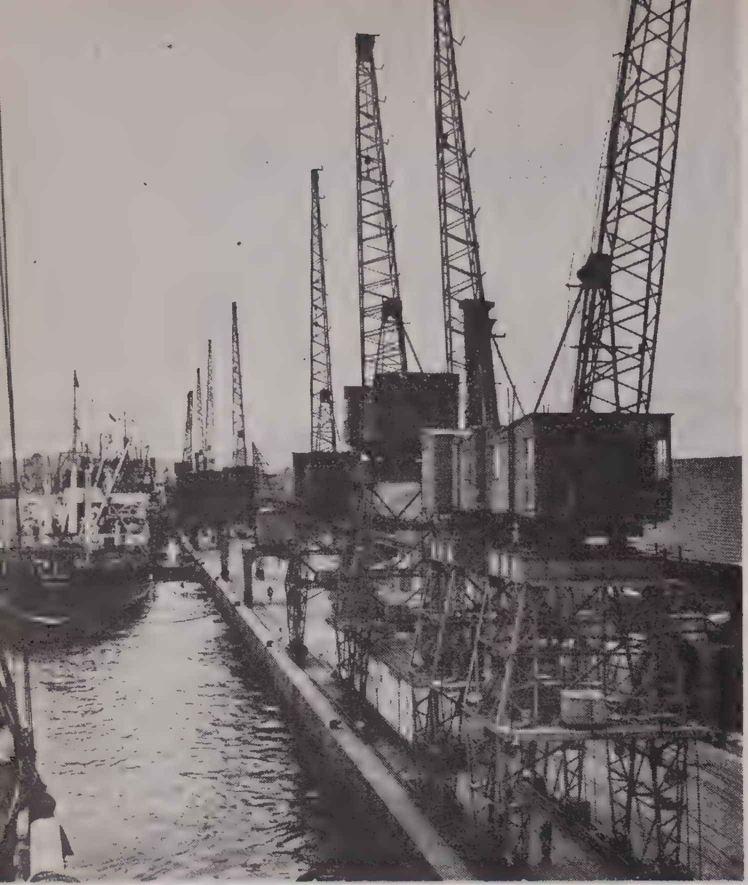


FIG. 5—Cranes on the waterfront at Santos. Facilities at the ore handling ports will require expansion and modernization.

Hills of

By **RALPH VAILL**
Consulting Engineer,
New York

FOR over a century Brazil has been very insistent as to her importance politically to the western world. Brazil feels herself a partner, in the full sense of the word, of the United States of North America in all hemispherical affairs and has a definite and well-defined conception of her international duty. If it is true that our western world is rushing into conflict with the other half of the globe, then the part that Brazil must play will be of vast importance. The pathway to Minas then becomes one of the western world's *must* undertakings.

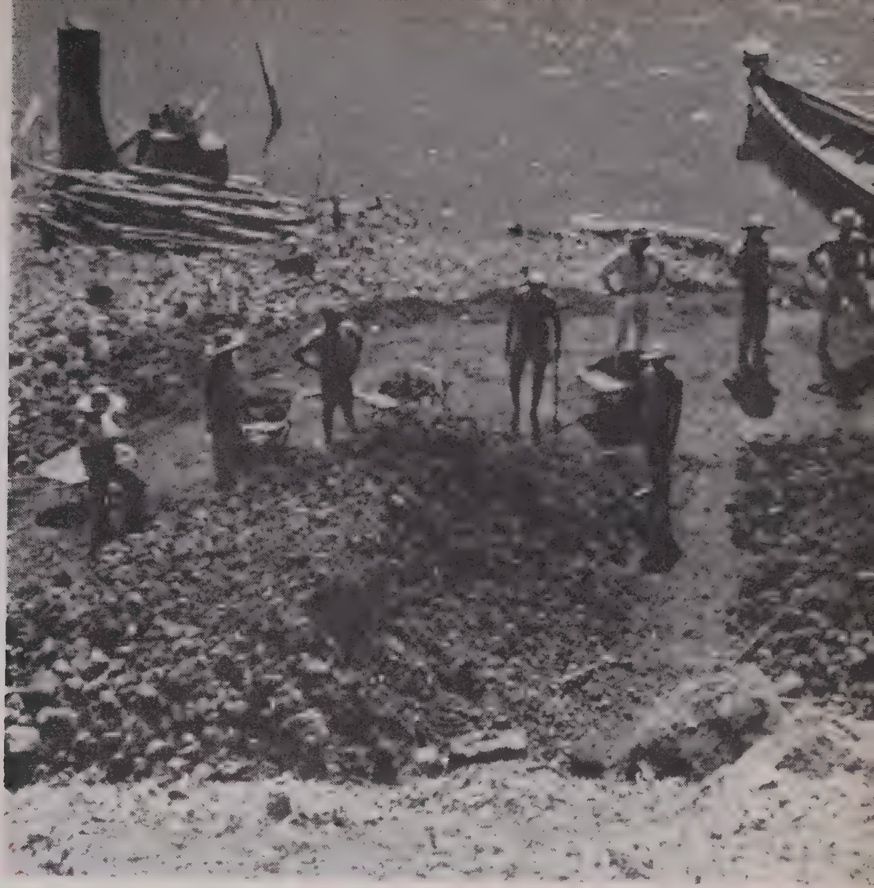
Time does not permit the retreat of the American steel industry to the seaboard to meet a now source of iron ore. The ore must be brought to the furnace where they now exist. There are some signs that Brazil is conscious of the lateness of the hour in this respect. It behooves us of the northern continent to acquaint ourselves with the historical, ethnological, political and economical reasons behind the backwardness of Brazil. We must also seek out those elements in Brazil that are trying to make Brazilians more useful to themselves and to the world.

It can be stated without fear of successful contradiction that the most powerful element in Brazil is the Army, fig. 7. Without the complete and active cooperation of the Army the broad highway to the iron ore of Minas will not be built. Unless we are greatly mistaken, the main target of this Army is inside rather than outside of Brazil. The brains of this Army is preoccupied with the many and manifest problems of curbing the greed and selfishness of the rich, suppressing the crookedness and graft in government, and raising the level of the 40 million little people. One only needs to know such men as Gen. Oliveira, ex-president of Cia. Siderurgica Nacional, Col. Edmundo Soares, founder and builder of this same national steel company, Lt. Col. Bernhauser, Ibere de Mattos, Rui Almeida, and the aviation generals Antonio Appel Netto and Gervasio Duncan to realize where the hope of the future rests. Gen. Dutra, the president of the nation, in his slow and cautious manner, has in the two years of his government laid a sound and firm foundation despite tremendous odds and the incredible stupidity of the politicians.

° ° °

FIG. 6 — Brazil's rivers have played a major role in the development of the interior. Manganese ore is shown being mined on the banks of the Amapary.

° ° °



Hematite

In the second of three articles on the iron ores of Minas Gerais, Brazil, the author suggests that time does not permit the retreat of the U. S. steel industry to the seaboard. Outlining the problems that must be surmounted to reach the Brazilian ore, the author traces Brazilian political history, prefacing his remarks with the statement that the most powerful element in Brazil is the Army. The ore of Minas Gerais does not remain underground or undisturbed because of climate, soil or season, but because of land tenure.

A little study of that which goes forward today in Brazil will show the pressure of these younger men of the Army in overcoming the industrial and commercial lethargy that confronts the builder of the road to the ore. Col. Edmundo de Macedo Soares in 1946 and 1947 gave to the nation a definite and well conceived plan for the improvement of harbors, railroads and highways and showed his people clearly the staggering burden they must shoulder if they were to move forward at the speed the times demanded. He asked them to import $400 million worth of machinery. Previous to the Soares plan, a commission under the co-ordinator for S. A. affairs had published an estimate that Brazil must buy in the 10 years following the war, about $2 billion of industrial products in order to put the agriculture, industry and transport of Brazil in a condition that would permit the nation to convert, as it must, its potential into actual wealth.

Col. Bernhauser, writing in the Bulletin of the General Staff, arguing for these expenditures, explains to Brazilians what all of this means to them in terms of cotton, coffee, vegetable oils, woods, leathers and minerals that must be exported. Col. Ibere de Mattos, disgusted with the demagoguery of politicians, and the vulnerability of his people to the promises of Utopia if only the party in power be removed, exhorts them to get to work, take in the belt and seriously go about the business of "creating their own Utopia from the potential wealth in the soil and sub-soil of Brazil." He advocates that the Federal government create a drastic and novel financial setup where two kinds of money will exist—static and dynamic—the former to be limited as far as possible to the buying and selling of nonproductive items, the latter to be as great as possible and devoted solely to furtherance of productive enterprise. He cries for "more geologists and fewer agitators."

In the first part of this article, THE IRON AGE, *Dec.* 16, 1948, *the author discussed the occurrence and properties of the ores in the Minas Gerais region.—Ed.*

FIG. 7—In all matters, political and industrial, the Army in Brazil is supreme.

It is well to remember that Brazil, "this great amorphous, thinly populated territory, belonged to Portugal, a nation of 1½ million inhabitants, for 300 years and was thereafter an independent empire distraught by survival of these old colonial methods." It was beginning to achieve a sort of imperial unity about 1890 when the empire was succeeded by the Federal Republic. No nation has ever had a greater amount of regional diversities to hinder its economic development.

Thanks to the greatness of its Emperor, Dom Pedro II, these sectional differences never really threatened the dismemberment of Brazil. As Joao Pandia Cologeras said, "Great and noble was the task performed by the empire. At the beginning of the reign of Dom Pedro II, Brazil was obliged to face widespread threats of disintegration, and yet it remained united. Though they lasted two full decades, local troubles eventually succumbed to the cohesive power of the empire. Methods of government had passed through a striking evolution from absolutism to parliamentarism and while the latter was not theoretically perfect, its functioning, thanks to the emperor and his moderative power, was at least tolerable."

As the last days of this monarch dawned, and political fissures were appearing in the imperial edifice, the economic structure of Brazil, surprisingly, grew and expanded in a very pronounced way. From 1866 to 1880 foreign trade grew from $150 million to $200 million. The monetary situation of the country was sound. The population was over 9 million, of whom 1½ million were slaves. Immigration was increasing each year. Railroad mileage was multiplied five times. This, it should be remembered, was also the period of penetration into the forest of the "mousetrap," for it was in these years that the geologists and mineralogists really became aware of the value of the iron ore deposit in Minas. These are the normal fruits of stability and peace in a nation, and this was a period when political life in the average Latin American nation was most turbulent in their history.

Into this turbulency was born the Republic. It succeeded a monarchy ruled by an aristocracy remarkable for its democracy. Gilberto Freyre says, "As a political system, the Republic established in Brazil in 1889 remained, as the Empire had been, more imitative than creative. Honesty among public men decreased. There was also a decrease in the elegance and dignity that had become characteristic of the Brazilian Parliament in the days of Dom Pedro II.

"On the other hand, there was an increase in efficiency in practical matters. Some of the new political leaders were notable for their ability to deal with economic and sanitary problems which had been somewhat neglected by the Empire. And a few surrounded themselves with scientists and engineers who began to do really creative work. It was not until the establishment of the Republic that a series of courageous projects for harbors and wharves, water works, sanitation schemes, city paving, draining and beautifying began in Brazil. Brazil fell in love with material progress.

"In most of these plans one can detect the dynamic impatience of the Brazilians who entered public life with the Republic. It was at this point that Brazil went into debt on a great scale, borrowing the necessary gold from European bankers."

By 1930 this foreign debt amounted to nearly $2 billion. To service this debt, and to pay foreign investors in Brazilian enterprises the due return for their investments, this nation, which from the time of the beginning of this indebtedness had grown from 9 million to 30 million people, had to send abroad annually nearly $200 million.

In 1945, according to the statistics of the foreign department, 25 million cruzeiros of pig iron were exported. Twenty-six million cruzeiros of iron ore were exported, and 60 million cruzeiros of manganese ore went to foreign markets, or in other words, only a paltry $4 million was contributed by the mousetrap in

Minas. And this was a year when the world was famished for iron or manganese ore. In addition to the 16,000 tons that were exported, millions of tons could have found an eager market. In this same year, 14 million bags of coffee valued at more than $200 million, were exported. It required more than 2 billion coffee trees to grow this coffee. Incidentally, our Minas Gerais has produced over $60 million worth of coffee in a single year.

In order to gain an equal revenue from iron ore, over 12 million tons must be mined and exported annually. According to general shotgun estimates, there is enough iron ore there to permit doing that for the next 1000 years. At 10,000 tons per cargo, that would require about 1200 ships per year, or nearly 4 every day. Although some loading facilities are available, fig. 5, these would have to be modernized and expanded at the ports near the ore fields.

It would require, at 2000 tons per train, about 6000 trains per year, arriving at the docks. This ore would purchase nearly 25 million tons of coal, or enough coal, if coked, to make 30 million tons of pig iron. From 16,000 tons per year to 12 million tons per year is rather a jump, but it is a leap that has been in the process of evolution for quite some time.

Probably one of the best accelerators of the speed of this evolution was the crisis of 1930 which brought in its train a revolution that gave to Brazil for the next 15 years a dictator. The direct cause of this crisis was a catastrophic drop in the price of coffee in the world's markets at a time when there was a stock of over 26 billion bats in Sao Paulo, or more than enough to supply the world for one year. This great stock was the result of overproduction and a foolish government policy of holding surplus production out of the market by payment of subsidies in order to maintain a high sales price. At a time when Brazil could not service its foreign loans, it was still trying to borrow more money abroad in order to pay this subsidy. So great was the economic importance of coffee that practically every phase of Brazilian life was affected by the rise and fall in coffee prices. So great was the power of the State of Sao Paulo in national politics that the country was compelled to gear its economy to coffee from the day in 1905 when the famous "Valorization" plan was conceived.

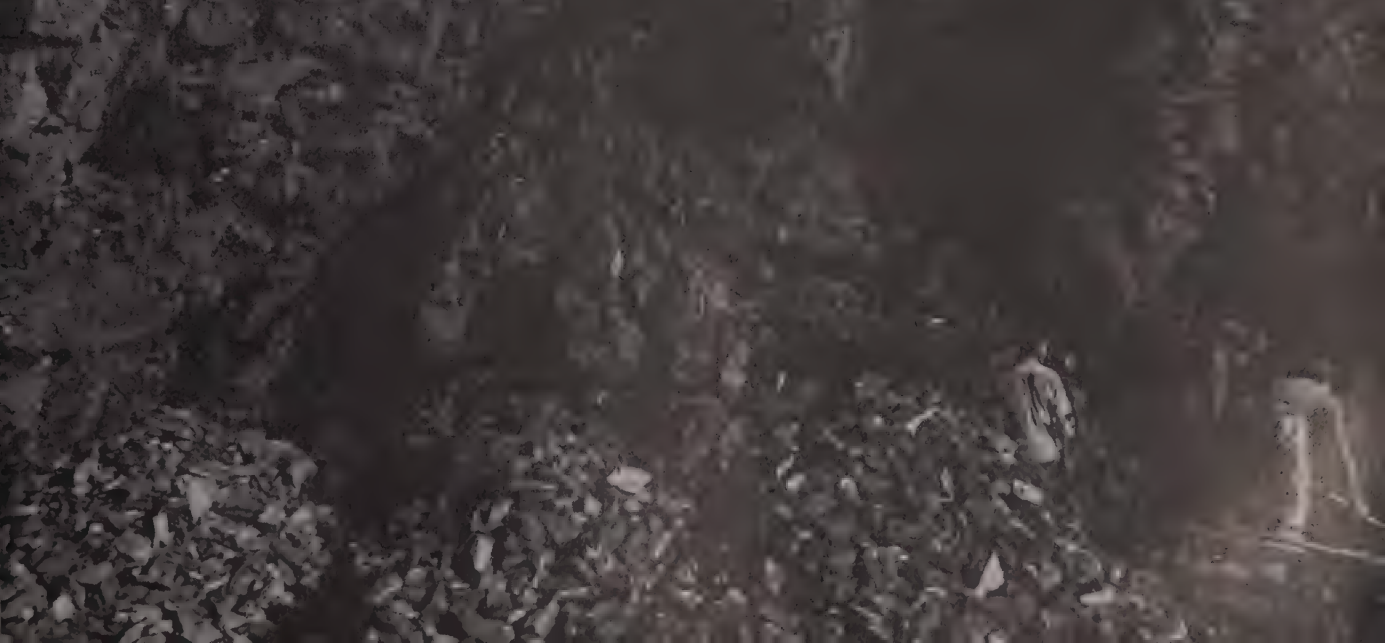
Gilberto Freyre calls this "A plan that stands as one of the most original contributions of Portuguese America to the science of economics and to the then very vague technique of government control of markets."

At the time this plan was formulated, the president, Rodrigues Alves opposed it, thereby earning the hatred of the powerful Paulistas, but history showed that the attempts of government in price control only aggravated the ills they tried to remedy.

Cotton is increasing as a factor in national economy, especially in the business of textile export. The world war brought about production and found markets for other products, especially quartzite and vegetable oils. But until a capital goods industry is built here, and iron and steel produced to build roads, open new lands, etc., coffee and Paulista politicians will rule the roost. With this apparent need for a broader based economy, why does not this nation of intelligent people move further, faster?

Any superficial study of the history of the de-

FIG. 8—Deposits in the Itabira mines run as high as 69 pct iron.



velopment of the ethnic unity called Brazil seems to lead to the conclusion that more than forests and mountains have been required to maintain the inaccessibility to its great iron ore reserves. When the historical speed with which the coal, iron ore, oil and copper lands of the United States of North America were ravished is compared with the apparently eternal virginity of the mountains of Minas, it brings conviction that forces other than physical have delayed the violation. In the three centuries prior to its industrialization, the United States of North America developed politically at an amazing rate—as only Anglo-Saxon peoples seem to be able to do. Big business needs sound politics.

In that same period, Brazil was forced to preoccupy herself with the building of the ethnic rather than the political aspects of democracy, a task not yet finished. Brazil has never had the political stability necessary for establishment of great private or corporate enterprises, but Brazil is gaining day by day in its fight to be a great social and ethnic democracy. That species of democracy is one of the first impressions one gets on landing in Rio, and encountering its heterogeneous population living in a bewildering freedom from racial or color consciousness.

Brazil has been favored by some truly great diplomats. One of these, the Barão do Rio Branco, in his solution of a dispute with Bolivia over the territory of Acre, removed probably forever the threat of occupation, by powerful and all but sovereign chartered foreign companies, of great tracts of unused lands of weak nations in South America. This was a triumph for Brazil and a service to all South America. To this same great statesman should also be given credit for bringing Brazil probably forever to the side of the USA in all hemisphere problems. He carried the tradition of continental solidarity to its furthest limits. Brazil and the United States were allies in World War I and World War II.

To Barão do Rio Branco the Monroe Doctrine was as much the business of Brazil as of the United States and its enforcement a common duty, not in any respect unilateral.

This Brazil that the Barão do Rio Branco believed so passionately should have a voice equal to that of another in continental affairs has a geographical location which supports the thesis. We Americans point with pride to our 3000-mile undefended boundary with Canada as witness that we are a good neighbor. Brazil has 10,000 miles of boundary with ten neighboring countries and an historical heritage of boundary dispute that was fathered by nearly every European war of the 16th, 17th and 18th centuries. Is it any wonder that thoughtful Brazilians reserve the choice niches in their hall of fame for those foreign ministers of theirs whose labors in the past 150 years have finally brought peace, order, and understanding along this enormous frontier? When we of the North speak about "good neighbor policy," we deal in abstraction. When your backyard is 10,000 miles long and is for thousands of these miles only a vague line through jungles or over uninhabited mountains and your neighbors change rulers, parties, policies with amazing frequencies and suddenness, sometimes peacefully and other times violently—then good neighborliness becomes a very concrete thing.

Within the first century after the discovery of Brazil this race of pioneers was developed in Sao Paulo. The hardy Portuguese who settled in this section apparently lost no time in creating a second generation of halfbreed Portuguese and Indians to whom has been given the name of "Mameluco." Per se they were fighters. In bands of various strength, generally under the banner or bandeira of a purer blooded Portuguese (hence the name Bandeirante), they roamed the hinterlands of South America from the River Plate to the Amazon, even crossing the Andes into Peru in their feverish search for gold, and land and slaves. It was these men who found Minas Gerais in 1622 when, under Fernão Dias Paes Leme, they crossed the Mantiqueira just to have a look on the other side of the mountains and later, in 1633, by another group under Castanto Taques who found gold and named the land Minas Gerais de Cataguas.

Brazil is as broad as it is long, about 2600 miles in each direction at longest geometrical axis. It covers 4 hr in time. It has 8000 miles of what are classed as navigable rivers from a total length of 12,000 miles. In fact, for a long time the early settlers were able to penetrate inland only over these rivers and today much territory between is not even known to man. Fig. 6 shows manganese ore being mined on the banks of the River Amapary. One of the rivers, the Rio Sao Francisco, was probably the earliest of all pathways to the mountains of Minas. Its waters are formed by the diversion caused by the Serra do Espinhaco, the mountains of our ore lands. This river bulks largely in Brazilian historical and political development. As in the United States of America, the U. S. of Brazil did not always want to remain united. Here also the South tended always to pull away. This great north and south artery of traffic probably influenced the maintenance of union more than any other single factor. Once again today it comes into the national picture, as the next locality at which will be concentrated the energies of Federal government in an endeavor to industrialize, reclaim, and utilize the countless acres of the great basin from the Spine Range in Minas through the vast Sertoes of Bahia to the delta on the Atlantic in Alagoas. If ever an opportunity was offered to government to promote the general welfare, it would seem to exist here.

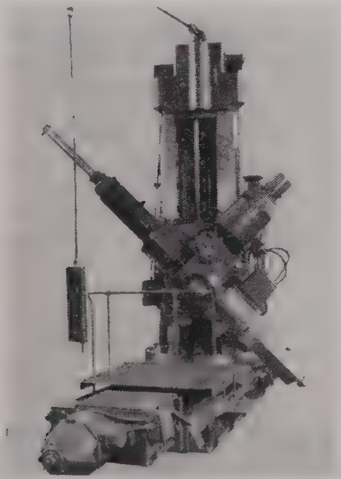
The ore of Minas Gerais, fig. 8, does not remain underground or undisturbed because of climate, soil or season. Back of all of this is the problem of land tenure. The ores will rest in peace, the ports remain unused, and a great proportion of the agricultural people of Brazil will wander in poverty over its millions of fertile acres, illiterate, diseased, ill-fed and clothed and practically un-housed until the lands of Brazil are given over to their use and they are made useful.

In the third and last article of this series, to appear in a subsequent issue, the author gives information on the cost factors involved in mining and shipping the Minas Gerais ores and, reporting on experience at Volta Redonda where the superb quality of the ore has been demonstrated, suggests that the excellence of the deposits may be the controlling factor in the development of the region.—Ed.

New Production Ideas . . .

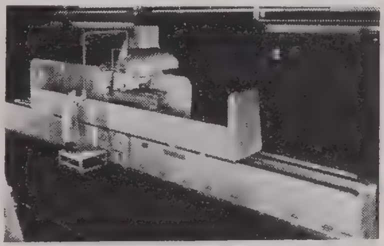
A traveling head planer, surface grinders, deep drawing and tilting head hydraulic presses, a metal rolling machine, shears and a circular sawing machine, a hydraulic wheel press, alternators, an induction hardening machine, remelting furnaces, motors and magnetic starters, and a steel bath pyrometer are new machines and equipment described this week.

A NEW universal traveling head planer is arranged for shaping, planing, and slotting, and has a 65-in. cutting stroke with 48 in. of vertical feed on the column. The bed is 17 ft long providing 10 ft horizontal travel. The column will rotate 360° and the ram is adjustable 25° either way from the horizontal position. A 9-in. sq forged steel ram provides rigidity in heavy duty work. A 60-in. ram bearing surface is provided in the saddle. The standard draw-cut shaper head has a 6-in. hand feed and uses 1½x2 in. cutting tools. Ac variable voltage motors and control equipment are provided. *Morton Mfg. Co. For more information, check No. 1 on the attached postcard.*



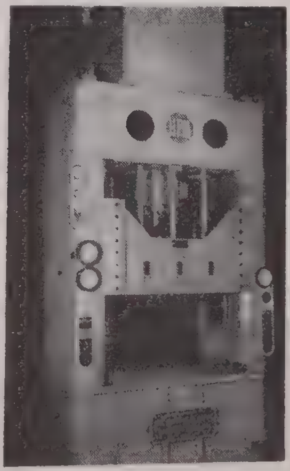
Heavy Duty Surface Grinder

THE hydraulic-way grinder illustrated is a heavy duty machine with a 46-ft bed length and developed to grind the ways of large lathes. It is equipped with auxiliary vertical spindle for grinding safety gib, clamp surfaces and rack seats on the machine bed. Lathe bed ways are ground with the horizontal spindle having a grinding wheel trued to the proper angle for Vs and flats. The working capacity of the horizontal spindle is 240 in. The column weighs over 10 tons. Operation is said to be easy with simplicity of control. Table speeds are variable between 10 to 100 fpm with single lever control. Hydraulic rapid traverse is 240 ipm and hydraulic wheel truing 6 ipm. The wheel head unit is powered with a 30 hp motor mounted directly on the wheel head. *Thompson Grinder Co. For more information, check No. 2 on the attached postcard.*



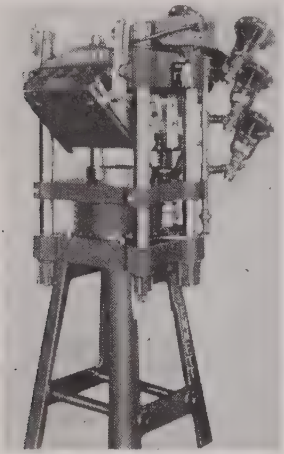
Metal Working Press

FOR rapid deep drawing and forming of sheet metal, a new 100-ton Fastraverse single action press has been designed. It is an all-hydraulic, self-contained unit with a 48x36-in. platen, 30-in. daylight and an 18-in. main ram travel. Located in the press bed is a 33-ton hydraulic die cushion with a 32x25-in. platen and 7-in. stroke. The press frame is a combination of castings and weldments that assure maximum strength and rigidity. The head incorporates the hydraulic cylinder with power ram that actuates the main slide. The press closes and opens at a rate of 770 ipm. It automatically reverses at a predetermined setting and slows down prior to die contact. Pressing speed under full load is 146 ipm. Operating on a 12-in. working stroke and building up 100 tons pressure on a solid surface, this press will cycle approximately 20 times per min. It is powered with a 40-hp electric motor. Operation is manual, semiautomatic or full automatic. *Hydraulic Press Mfg. Co. For more information, check No. 3 on the attached postcard.*



Hydraulic Press

THE tilting head hydraulic press, Model E-113, has been designed for applications requiring high-speed operation, accuracy of mold register, convenience of loading, and ease of stripping molded products. It is available in two sizes having platens of either 14x14 in. or 24x24 in., and may be supplied with heated platens. Construction features include bronze bushing guides on lower platen; annealed steel ram, cylinder and head castings, and a self-contained packing cartridge that may be removed quickly. Operating speed is 3 sec, including opening or closing of mold and tilting head. The small press is stressed for a maximum pressure of 3000 psi, 124-ton maximum, and the large press for a pressure of 2500 psi, 284-ton maximum. Pullback operation is by means of a telescopic ram located inside the main ram. Daylight opening on both presses is made to specification. Normal stroke is 2½ or 6 in. in the 14x14 size and 8 in. in the 24x24 size. *Emmett Machine & Mfg. Co., Inc. For more information, check No. 4 on the attached postcard.*



Squaring Shears

SIXTEEN-GAGE capacity foot squaring shears combine increased strength and rigidity with light weight and easy action. The bed, a rigid one piece weldment, and the deep crosshead, guided in flat bronze ways, give a solid nondeflecting support to the knives. A large, torsion-resisting, cross shaft assures equal motion on each end of the crosshead regardless of where pressure is applied to the full length non-slip treadle. These shears are available in 30, 36, 42, and 52-in. widths. *Niagara Machine & Tool Works. For more information, check No. 5 on the attached postcard.*

Industrial Seismograph

A PORTABLE seismograph for use in industry analyzes vibration problems on machinery and other equipment. It is a combination of a special seismic pendulum mounting. The Vibrograph embosses a permanent record of vibrations on a transparent film, recording over the range of 600 to 15,000 cycles per min and amplitudes as low as 0.0001 in. or as great as 1/16 in. Vibrations with a frequency as low as 120 cycles per min can be measured, even in swaying buildings where no steady reference point is available. *Westinghouse Electric Corp. For more information, check No. 6 on the attached postcard.*

Circular Sawing Machine

DEVELOPED to handle stock up to 4 -in. round or square, the No. O-H circular sawing machine is designed to hold cut-off pieces to close tolerances on either automatic or manual bar feed. Cut-off length is set on built-in scale, with micrometer adjustment, on the intake side of the machine. A hydraulic pump supplies pressure for automatic stock feed, stock clamping and head stock feed. All operations are sequenced hydraulically for safety in tooling. The saw head has four blade speeds with a choice of speed ranges for ferrous and nonferrous metals. *Motch & Merryweather Machinery Co. For more information, check No. 7 on the attached postcard.*

Steel Bath Pyrometer

FOR high-speed measuring of molten steel temperature, a photo-electronic bath pyrometer has been developed that consists of an air-purged immersion tube having a photo-electric cell mounted at its rear end. An electronic indicating and recording unit with a scale and chart graduated 0 to 3100°F with approximately 12th-power graduations to correspond with the photocell output is a standard potentiometer modified to provide remote energizing of the balancing motor through the pushbutton on the immersion unit. The balancing motor is also energized when the standardizing button is depressed. The amplifying unit and the 24-hr chart-drive circuit are continuously energized, giving immediate response to temperature indication when the pushbutton on the purged sighting tube is depressed, and continuous indication of last temperature reading plus the exact time the temperature was taken. The recorder is usually located on the instrument panel for each furnace or on a separate panel that is visible to the operator when using the tube. *Brown Instrument Co. For more information, check No. 8 on the attached postcard.*

Heat Exchangers

REDESIGNED heat exchangers of the BCF type are announced as achieving the lowest cost per Btu transferred in diesels, gas engines, compressors, hydraulic machinery, blowers and other industrial applications. This line consists of shell and tube exchangers and is claimed to be equally effective in heat recovery, vapor condensing, and process heating applications. *Ross Heater & Mfg. Co. For more information, check No. 9 on the attached postcard.*

Hydraulic Wheel Presses

TO facilitate ease and speed in assembling or removing wheels, pulleys and gears, a new line of self-contained hydraulic wheel presses with capacities from 50 to 600 tons has been developed. A typical size has a 48-in. clearance between bars, 128 in. maximum daylight, 24 in. ram travel, and daylight adjustments of 24-in. increments. The resistance yoke is equipped with a stop block for use in contacting the end of axles when mounting wheels and a throat block is provided on the end of the ram

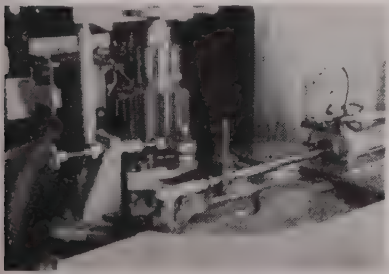
for clearing the axle when forcing on wheels. Remote push button operating control, mounted on a swinging arm, enables the operator to control the press ram movement at an advantageous position. The power unit is an HPM variable delivery, oil hydraulic pump with direct electric motor drive. *Hydraulic Press Mfg. Co. For more information, check No. 10 on the attached postcard.*

Cast Iron Electrode

FEATURING the 1949 formula Frigidarc flux coating, a new low temperature welding rod, EutecTrode 24/49 has been developed to produce strong bonds and high tensile welds that are machinable through the weld and the weld zone on both gray and alloy cast iron, without preheating. The electrode is applied at lowest currents to produce true low heat welds. It applies quickly and easily with ac or dc with either straight or reverse polarity. The EutecTrode 24/49 is available in 3/32, ⅛, and 5/32-in. diam. *Eutectic Welding Alloys Corp. For more information, check No. 11 on the attached postcard.*

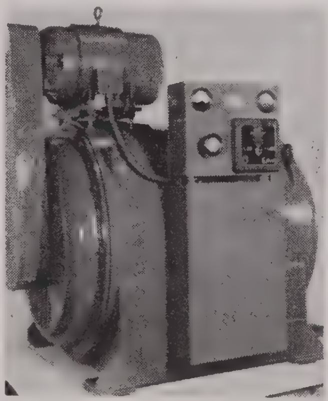
Induction Hardening Machine

AN automatic, heating, quenching and indexing unit for hardening gear teeth, one tooth at a time, by induction heating has been developed. Handling involves only the insertion and removal of gears. Gears that, because of their size, would require very large equipment to be hardened in one operation, can be done with 20 kw equipment and the use of this machine. Gears ranging from 20 in. diam with a 12 in. face or larger, depending upon generator capacity, are accommodated by this unit. Upon pressing the start button after the gear is inserted, each tooth of the gear is automatically heated, quenched and indexed until every tooth has been processed. Controls are contained in a cabinet attached to the unit. *Induction Heating Corp. For more information, check No. 12 on the attached postcard.*



Alternators

A NEW series of alternators permits a top capacity of 300 kw at 1800 rpm, 60 cycles. The machine is available at speeds of 720, 900, 1200 and 1800 rpm, with direct connected exciter on the high speed designs and top mounted exciters on the lower speeds. Rotors, mounted on sealed-for-life, cartridge-type bearings, are constructed with dampner windings to facilitate parallel operation. The stator is made of 26 gage, coated dynamo steel with ⅜ in. ventilating air space for each 3-in. of lamination stock. The voltage regulator control panel is mounted on top of the outlet cabinet. *Kato Engineering Co. For more information, check No. 13 on the attached postcard.*

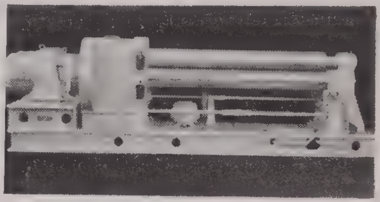


Pressure Reducing Valve

EMPLOYING internal pilot piston operated construction, a high pressure reducing valve is designed for steam, air or gas service, handling inlet steam pressures from 300 to 1500 psi and air or gas inlet pressures from 300 to 3000 psi. Reduced pressure range is from 100 to 600 psi. Maximum inlet temperature is 1000°F. Interchangeability of replacement parts makes a complete overhaul possible without removal of the main body from the pipe line. The main valve is hardened stainless steel with a hard faced seating surface. The valve is available in 1, 1¼, 1½, and 2-in. with Series 90 or 150 flanges or welding ends. *Leslie Co. For more information, check No. 14 on the attached postcard.*

Rolling Mill

A ROLLING machine for pipe, well casing and general metal rolling is a heavy duty unit of the three-roll initial type, capable of rolling heavy gage and alloy steels. Rolls are forged of SAE 4140 alloy steel and gears are heat treated and hardened. The unit has a specially wound stator motor, which is a three-phase ac gearhead motor or variable speed slip-ring motor with separate gear box. The rear bearing on the top roll is available either with manual operation or automatic air cylinder operation. Sizes and lengths are manufactured to suit particular requirements. *Valley Foundry & Machine Works. For more information, check No. 15 on the attached postcard.*



Miniature Ball Bearing

MINIATURE ball bearings are now offered with small OD and large bore. The bearing is the full-race, radial-type with 15 balls 1 mm diam. All surfaces are precision finished and all tolerances are ABEC 5. The bearing is available in chromium alloy bearing steel and 440 stainless and weighs ¼ g. *Miniature Precision Bearings, Inc. For more information, check No. 16 on the attached postcard.*

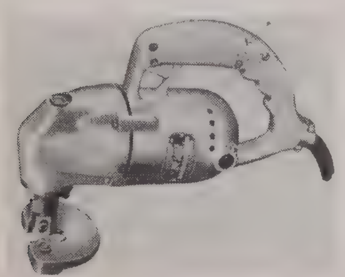
Magnetic Starters

A NEW line of ac magnetic starters has been designed for starting and protecting motors up to 50 hp. They are furnished in all NEMA sizes from 0 to 3 and contactors can be furnished in NEMA sizes from 00 through 3. A one-piece plastic-encased coil enclosure protects the windings against dirt, moisture, or possible damage during installation. Clamp-type coil terminals are firmly embedded in this enclosure to prevent loosening. Silver contacts are easy to inspect, interchange, and remove without the use of special tools. An asbestos arc shield prevents arc-over between contacts.

The silicon steel magnet has a permanent air gap in a non-wearing surface to insure quick dropout. Starters are either open or mounted in general purpose, watertight, dust-tight, or hazardous atmosphere enclosures. *General Electric Co. For more information, check No. 17 on the attached postcard.*

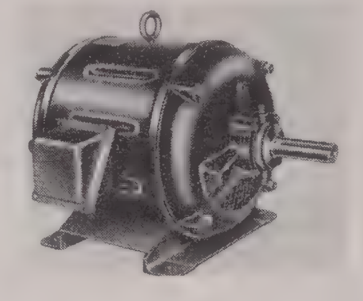
Shear

A NEW Porto-Shear will cut 12 gage standard sheet metal, approximately two gages thinner in Monel metal and stainless steel, and approximately 50 pct above the rating in sheet copper, aluminum, lead and other nonferrous metals. This portable shear will follow an irregular pattern because the cutting blade is visible and it will cut on a radius as small as 1½ in. A rapid reciprocating action of the vertical blade against the stationary horizontal blade makes a clean smooth cut without burrs or ragged edges on either piece. A universal motor delivers 1100 strokes per min at full load. The handle contains an instant-release trigger switch with locking pin for continuous use. *Black & Decker Mfg. Co. For more information, check No. 18 on the attached postcard.*



Polyphase Motors

DRIP-PROOF design previously incorporated in Wagner motors in frames 225 and smaller has now been extended to include polyphase motors in the 254, 284, 324 and 326 frames. The new larger motors differ from the smaller only in the omission of ventilating openings. Because there are no frame openings these motors, available in both sleeve-bearing and ball-bearing design, are drip-proof in sidewall or ceiling horizontal positions when end plates are correctly rotated. Frames are formed of rolled steel shaped to center the stator core and to provide passages between the frame and core for ventilation. An auxiliary fan draws in air through the openings in the front end plate, forcing it through these passages and out through the endplate openings on the drive end.



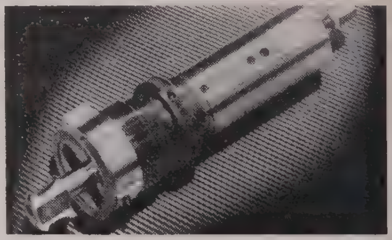
Screens on endplate openings prevent material from being drawn into motor. *Wagner Electric Corp. For more information, check No. 19 on the attached postcard.*

Remelting Furnace

NEW metal furnaces for remelting soft metals are available in the Model 2000 that has a 1-ton capacity metal pot and the Model 650 that has a 650-lb capacity pot. Both are equipped with hinged covers, ventilating pipe connections, bottom draw-off valves with swing spouts, and heating arrangements. They may be supplied without the bottom pouring valve for plants where hand ladling or pump casting is required. These furnaces may be equipped for heating by electricity or gas. Regularly furnished for temperatures up to 850°F, they may be arranged to give any necessary temperature range to meet special requirements. Automatic temperature control is optional. Larger pot sizes up to 5 tons can be furnished. *Nolan Corp. For more information, check No. 20 on the attached postcard.*

Recessing Tools

RECESS-O-MATIC recessing tools developed for use on multiple-spindle automatics can be attached quickly, and, for actuation, utilize a telescoping draw-bar that connects to the back of the machine. Work setup requires no cam change. Adjustment for locating recess is made in conjunction with the feed cycle of the cam, and adjustment for recess diameter is made on the tool itself with a micro-adjusting nut. Actuating mechanism of the tool reduces machine feed in a ratio of 2.75:1 to recess cutter. Recessing work of various diameters, up to capacity of each holder, is accomplished by the positioning of the cutter holding block in the tool, making it possible to work at extreme capacity of the tool without increasing cutter overhang. *Maxwell Co. For more information, check No. 21 on attached postcard.*



Rust Inhibitor

A RUST inhibiting action paint recently developed, is tough, resilient, colorless and can be used on all metals. The paint can be applied over treated or untreated, porous or nonporous, new, old or welded metal. When applied after scale is removed it is said to stop rust from creeping. When used as a primer, the product will anchor the finishing coat to the raw metal. It is reported to have withstood salt spray tests for over 200 hr. *Graham Co. For more information, check No. 22 on the attached postcard.*

Duplex Strainer

A DUPLEX strainer has been designed to handle fluids with a high solid content without the necessity of interrupting pipe line operation to clean the strainer. The units are suitable for intermittent or continuous flow. Flexibility of design permits the handling of sudden surges of solids. Flow through the unit is diverted from one straining chamber to another by a handwheel. While flow passes through one straining chamber, the other may be cleaned. This strainer is adapted to high open area ratio and is suitable for a wide range of pressures and temperatures. Valve seats are removable and valve stems are supported at both ends for accurate permanent alignment. Strainers are available in bronze, steel, semi-steel and cast iron with strainer baskets made to specification in perforated brass, Monel, or other metals. *J. A. Zurn Mfg. Co. For more information check No. 23 on the attached postcard.*

Metallic Packing

MONOPAK is a new, multiple duty, hydraulic packing used for sealing various liquids and gases throughout a wide range of temperature and pressure. It will seal against oil, water, brine, air, gases, steam, weak acids, weak caustics and refrigerants. It withstands temperature from -50° to +300°F and resists pressure from 0 to 3000 psi. It may be used for rods, packed pistons and is said to be effective on either reciprocating or rotating surfaces. Each sealing element is composed of two staggered babbitt split-rings, cushioned in a ring of resilient synthetic rubber. The split-rings create a seal at the moving surface, but the cushion-ring acts only as a housing seal and never touches this surface. Monopak may be obtained in any size from ½ in. ID to 36 in. OD. *Hydraulic Accessories Co. For more information, check No. 24 on the attached postcard.*

Elevating Table

SUITED particularly for die handling, a new 4000-lb capacity hydraulic elevating table has a 14-in. range, the lowered height being 28 in. and the elevated height 42 in. The table is portable and can be used to transfer dies between storage racks and presses. The elevating feature allows each die to be transferred at press bed or storage rack level. Table top is 30 x 30 in. and it revolves fully or can be locked in a fixed position. Adjustable height permits heavy overhanging work to be supported evenly. This unit is also recommended for use as a modified sheet feeding table for handling heavy sheets. Portability under load is provided by two ball bearing swivel casters and two rigid casters with 6 in. wheels. *Lyon-Raymond Corp. For more information, check No. 25 on the attached postcard.*

Heavy Duty Glove

A NEW heavy duty glove for handling small castings, rough stock, grinding and similar work is made of specially treated, chrome tanned cowhide and features a canvas back with elastic strap to overcome hand fatigue. Seams are steel sewed and seam along forefinger has been eliminated for longer glove life. The palm has been extended to increase wearing surface and bib patch has been eliminated. A steel stapled strap at thumb crotch is provided to fortify this part of the glove. Glove has short cuff with tape binding. *American Optical Co. For more information, check No. 26 on the attached postcard.*

Expansion Joints

FLEXIBLE rubber expansion joints recently introduced are for installation in pipe lines to relieve stresses in piping and equipment. These joints compensate for linear expansion and contraction caused by temperature changes, to absorb vibration, to reduce or eliminate the transmission of undesirable noise, and to compensate for minor misalignment in the piping. They are described as spool type joints in which the rubber compound is combined with piles of cotton duck and the body or carcass of the joint is further reinforced with steel wire or rings. For services where oil resistance is necessary these joints are available with a tube or liner made of neoprene. *Garlock Packing Co. For more information, check No. 27 on the attached postcard.*

FIRST CLASS
PERMIT No. 36
(Sec. 510 P. L. & R.)
New York, N. Y.

BUSINESS REPLY CARD
No postage necessary if mailed in the United States

4¢ POSTAGE WILL BE PAID BY

THE IRON AGE
100 E. 42nd St.
NEW YORK 17, N. Y.

12/23/48
1

THE IRON AGE, New York 17, N. Y.

Send us additional information as circled below

1	2	3	4	5	6	7	8	9	10	11	12	13	14
15	16	17	18	19	20	21	22	23	24	25	26	27	28
29	30	31	32	33	34	35	36	37	38	39	40	41	42
43	44	45	46	47	48	49	50	51	52	53	54	55	56

NAME .... TITLE ....

PLEASE STATE BUSINESS..

COMPANY ....

CO. ADDRESS ....

CITY.................................... ZONE....... STATE........

Information Free . . .

Safety Equipment

INFORMATION on where to use, how to use, how to maintain and how to select industrial protective equipment is given in 64-page catalog. Goggles, face shields, respirators and welders' protective clothing are discussed. *Chicago Eye Shield Co. For more information, check No. 28 on the postcard.*

Light Metal Diecastings

BOOKLET describes the engineering design features, diecasting machines used, and the machining and finishing of magnesium and aluminum diecastings. Tables show typical physical and mechanical properties and give the standard design tolerances and limits. *Litemetal Diecast, Inc. For more information, check No. 29 on the postcard.*

Automatic Arc Welder

BULLETIN gives information on automatic arc welder, ac or dc, using standard cut-length coated electrodes from ⅛ to 11/32 in. diam. Continuous welding with no break in the arc during electrode changes can be carried out. *Elge Associates. For more information, check No. 30 on the postcard.*

Instrumentation System

BULLETIN R-10 describes an instrument system which uses a differential transformer with a linear response to measure, record and control pressure, flow, temperature, vacuum, thickness or other process variables. *Automatic Temperature Control Co., Inc. For more information, check No. 31 on the postcard.*

Bulk Materials Handling

BULLETIN gives information on ore unloaders, coke oven machinery, a blast furnace skip hoist, a rotating ingot charging and drawing machine, and other units for handling heavy bulk materials. Weight savings and greater strength in the units are attained by welded construction. *Wellman Engineering Co. For more information, check No. 32 on the postcard.*

Industrial Trucks

CENTER control and rear control powered industrial trucks, with all principal component parts interchangeable between the two models, are discussed in folder. Each type is available in 5 power ratings, ranging from 1000 to 8000 lb. *Elwell-Parker Electric Co. For more information, check No. 33 on the postcard.*

Drives and Speed Reducers

WORM gear drives and speed reducers, in standard and special designs, are described in two bulletins. Speed reducers stress compact design for savings in weight and space. Applications in conveying systems, coke plants, openhearths and other uses are shown. *Cleveland Worm & Gear Co. For more information, check No. 34 on the postcard.*

Bench Grinders

UNIVERSAL, semi - universal and plain precision bench grinders which grind from 0.00001 to 0.000005 inches in roundness are discussed in booklet. The grinders feature a double-taper bearing design and spring-loaded separate motor drive. *Crystal Lake Grinders. For more information, check No. 35 on the postcard.*

Stainless Tubing

BULLETINS give information on stainless steel tubing in seamless and welded grades from 0.008 to 1.0 in OD. Capillary sizes can be furnished with a braided stainless covering which gives added mechanical strength. *J. Bishop & Co., Platinum Works, Stainless Steel Div. For more information, check No. 36 on the postcard.*

12/23/48

THE IRON AGE, New York 17, N. Y. **2**

Send us additional information as circled below

1	2	3	4	5	6	7	8	9	10	11	12	13	14
15	16	17	18	19	20	21	22	23	24	25	26	27	28
29	30	31	32	33	34	35	36	37	38	39	40	41	42
43	44	45	46	47	48	49	50	51	52	53	54	55	56

NAME .... TITLE ....

PLEASE STATE BUSINESS......................................

COMPANY ....

CO. ADDRESS..

CITY.............................. ZONE....... STATE........

FIRST CLASS
PERMIT No. 36
(Sec. 510 P. L. & R.)
New York, N. Y.

BUSINESS REPLY CARD
No postage necessary if mailed in the United States

4c POSTAGE WILL BE PAID BY

THE IRON AGE

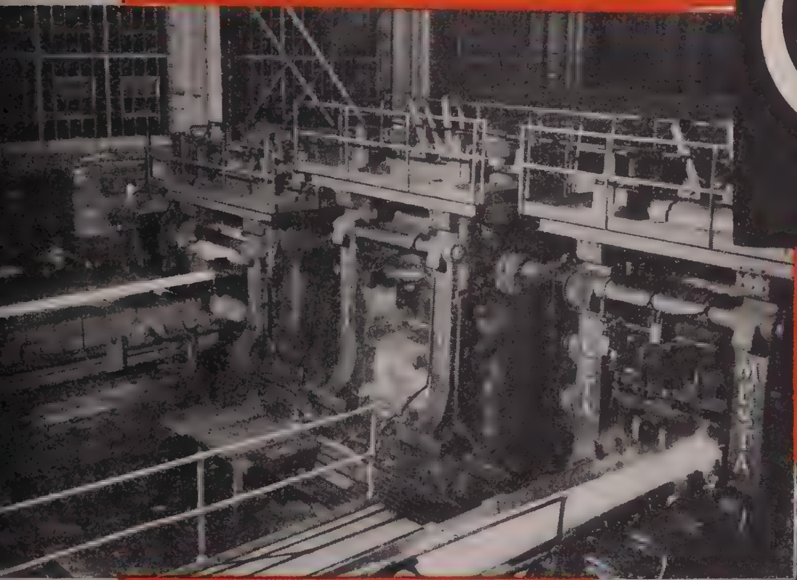
100 E. 42nd St.

NEW YORK 17, N. Y.

Bar and Structural Mills

Designed and Built by

MESTA



Mesta Two-High and Three-High 29" Structural Mill with Traveling Tilting Table

Mesta 29" Structural Mill

Mesta 32" Bar Mill

Mesta 29" Structural Mill with Traveling Tilting Table

Designers and Builders of Complete Steel Plants

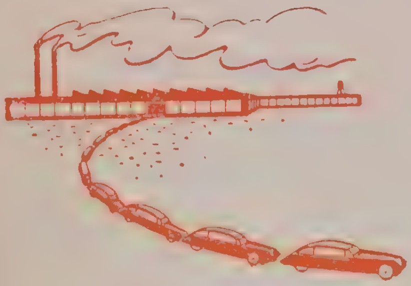
MESTA MACHINE COMPANY

PITTSBURGH, PA.

Assembly Line . . .

WALTER G. PATTON

• Full details of Olds' new rocket engine are disclosed . . . Olds "76" has latest GM body . . . Fire halts Mercury assembly line.



DETROIT — One of the best yardsticks for measuring progress in automotive power plant design and performance became available last week when Oldsmobile gave out for the first time the full engineering details of its new "Rocket" engine.

Compared with the original Oldsmobile engine which powered the "Curved Dash" Oldsmobile models of 50 years ago, the new 1949 Rocket engine is 9 in. shorter in length and only 4 in. wider; yet it develops 19 times as much horsepower as its one cylinder, "7-horse" predecessor.

The new Olds engine (sometimes referred to as the Kettering high compression engine) develops 20 more horsepower than the 1948 in-line 8-cylinder engine. Operating at a compression ratio of 7.25 to 1, the engine will run without knocking on most premium fuels.

The engine is basically designed to permit a compression ratio of 12 to 1 with only minor changes in the present design. Olds engineers estimate that fuel efficiency will be improved 33 1/3 pct when the 12 to 1 ratio can be employed.

A short high carbon alloy steel crankshaft with five main bearings is used in the new engine. There are six counterweights.

Connecting rods feature I-beam construction and are made of heat-treated, drop-forged steel. Thrust surfaces are ground to close limits to insure a minimum amount of friction.

The pistons are a low-expansion type aluminum alloy, reinforced with steel struts. The new design features cutaway skirts that are automatically self-adjusting, minimizing "piston slap" normally occuring on a cold start.

New hydraulic valve lifters maintain zero clearance throughout the valve linkage, so that any lash that may develop is automatically taken up. An exceedingly fine precision job is required for the new type valve lifters which, it is understood, have to be assembled under oil.

In its 8-cylinder block Olds continues to use alloy iron. The new blocks are heavily ribbed to give additional rigidity and strength.

The cylinder head is the valve-in-head type. The bore is 3¾ in. and stroke is 3 7/16 in. Displacement is 303.73 cu in. Brake horsepower at 3600 rpm is 135.

The cylinder head is the valve-in-head type and the new combustion chamber is said to be cast to closer limits than ever before.

The new "Rocket" engine has 100 pct full pressure lubrication, a double-acting fuel pump and automatic spark control. The new carburetor is designed to operate without danger of vapor lock.

The battery of the new Olds is conveniently placed under the hood at the left side of the engine opening. The battery is 17 plate with 115 amp-hr capacity.

BY means of a slightly longer piston stroke, a larger bore and heavier crankshaft the six-cylinder engine which will power the series "76" has been boosted from a rating of 95 to 105 hp. The bore of this engine is 3 17/32 in. and stroke is 4⅜ in. Electro-hardened aluminum alloy pistons fitted with two compression and two oil control rings are specified. A single plate-dry disc clutch is used and the car is equipped with Syncro-Mesh transmission.

The under hood battery is 15-plate, 100 amp-hr capacity. Both the Futuramic "76" and Futuramic "98" use quadri-coil springs, with knee action front suspension and heavy coil springs in the rear. The cars have 4-way stabilization through dual stabilizing arms, front and rear ride stabilizers and a lateral stabilizer at the rear.

Steering is dual center-control, worm-and-double-roller design. The "98" will have 191.7 sq in. of brake lining area compared with 159.8 sq in. for the "76" series. 7.10 x 15 low pressure balloon tires are used on the "76" and 7.60 x 15 low pressure balloon tires are specified for the "98".

The wheelbase of the larger car is 125 in. compared with 119½ for the "76" model. The additional line of cars Olds is expected to introduce during January will be equipped with the 8-cylinder "Rocket" engine.

WITH the introduction of the Olds "76", the public had its first look at the new General Motors A-type body.

There is more leg room for both front and rear seat passengers and additional cross-wise seating room in front and rear.

Glass area of the windshield is increased 28.5 pct. The windshield is also higher and is curved in such a way as not to distort vision through its entire range. Following the radius of the windshield, the driver's line of vision passes through the glass at approximately the same angle at either end as it does straight ahead.

The front pillars of the new body are set back appreciably. These pillars have also been slenderized and have their narrowest profile in line with the driver's vision. The rear glass area has also been increased. Safety-plate glass is used all around.

In the new bodies, the rear seat is moved forward 18½ in. ahead of the center line of the rear axle.

WHEELABRATOR®

makes cleaning dollars go farther . . . for small foundries too

The remarkable economies of "Wheelabrator" airless abrasive blast cleaning are not restricted to large installations. Of the more than 5,000 Wheelabrators now in use, a great number are in small foundries, some pouring as little as two or three tons daily. Yet even in operations of this scale, the right Wheelabrator for the job proves profitable. Let's let these foundry case histories speak for themselves:

1 cupola — 2 tons daily — $20.00 a day savings are being realized by Craftools, London, Ont. with their 27" x 36" Wheelabrator Tumblast which is cleaning grey iron castings.

1 cupola — 4 tons daily — When a 36" x 42" Wheelabrator Tumblast was installed at Hillsdale Foundry Co., Hillsdale, Mich., it faced a two-week accumulation of uncleaned castings. Half of this was Wheelabrated the first day and the owner said the machine turned out more and better work than they could have done in a week with the two tumbling mills formerly used. He was surprised at the quietness and cleanliness of the machine and said it was the best investment he had ever made.

2 cupolas — 6 to 8 tons daily — "We believe we are probably the smallest shop employing the Wheelabrator (a 36" x 42" Tumblast) as we have only the capacity for about fifteen molders on light work, but we were forced to use the Wheelabrator because our big competitors offer this finish and in order to compete we had to be able to give it. We feel that we have definitely improved our competitive position in the industry by being able to offer the customer a Wheelabrated finish without having it cost us a great deal of money." Hirshheimer Foundry, LaCrosse, Wis.

These same advantages can be yours. To help you in the selection of the right machine for the job, the services of American engineers are at your disposal. In the meantime write for Catalog 74-A "The Airless Wheelabrator, What It Is — What It Will Do."

66" Wheelabrator Swing Table at Arneson Foundry, Inc., Kenosha, Wis., "cleans castings with annealing scale better and faster," in the words of their superintendent.

The ever popular 27" x 36" Wheelabrator Tumblast . . . a 5 cu. ft. mill . . . cleans 200 pound loads of gray iron castings in 4 minutes at Marrin Foundry Co., Minneapolis.

American

WHEELABRATOR & EQUIPMENT CORP.

510 S. Byrkit Street
Mishawaka 3, Indiana

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT

Through the use of a new zig-zag type spring for the front seat, leg room for the rear seat passengers has been increased nearly 2 in. The design of the new spring provides greater clearance over the floor, making possible the increased leg room.

A new ball and roller type front seat adjuster permits freer range of movement of the front seat up to 4⅜ in.

New push-button type door handles are specified. It is not necessary to twist the handle which is designed for a natural grip of the hand. The doors open by a slight pressure of the thumb.

The size of the baggage compartment lid opening has been increased. A new type of spring-loaded hinge is used which performs both the counter-balancing and hold-open function.

The storage compartment lid is equipped with a toggle-action slam-type lock. When the lid is closed it locks automatically. When the key is turned, the locking bolt is disengaged from the striker and the handle serves merely as a grip for lifting the lid.

Instrument panels have been completely redesigned with the instruments grouped directly in front of the steering wheel. The wheel is designed to permit unobstructed view of all instruments. The clock has been taken off the glove compartment door and placed in the center of the instrument panel.

The bumper and grille of the new cars have been redesigned and a new emblem is mounted on the hood.

Most motorists may find difficulty distinguishing between the "98" and the "76". There are no apparent differences in fender, windshield and front end design of the two cars. There is slight difference in the rear quarter panel, however.

•

Names New Board Members

Detroit

• • • **Automotive & Aviation** Parts Mfgrs., Inc., Detroit, has elected five new members to its board of directors. Elected to a 3-year term are: L. M. Clegg, executive vice-pres. Thompson Products, Inc.; A. G. Drefs, president, McQuay-Norris Mfg. Co.; W. G. Hancock, president, McCord Corp.; D. H. Kelly, executive vice-president, The Electric Auto-Lite Co.; J. L. Myers, president, Cleveland Graphite Bronze Co.

Officers of AAPM for the coming year are: President, M. P. Ferguson, Bendix Aviation Corp.; vice-president, R. H. Daisley, Eaton Mfg. Co.; and secretary-treasurer, J. L. Myers, Cleveland Graphite Bronze Co.

Fire Halts Operations

• • • Following a $500,000 fire which completely halted Ford and Mercury production at the Rouge plant, assembly operations have been resumed on all but the Mercury line.

Normal Mercury production at the Deroit plant is expected to be resumed early in January. In the meantime output of the Detroit plant will be picked up by various assembly units in other parts of the country.

Curiously enough, a second fire in a Detroit auto plant occurred on the same day. The Brigg's Mfg. Co.'s automobile cushion conveyor was also badly damaged by fire. Production, however, was resumed after only a short delay.

Name New Wright Officers

New York

• • • **William C. Jordan,** vice-president and general manager of Wright Aeronautical Corp., the engine-building division of Curtiss-Wright Corp., and former general manager of the Curtiss-Wright Airplane Div., was elected president and director of both Curtiss-Wright and its subsidiary, Wright Aeronautical Corp., at meetings of directors of the two companies here recently.

Guy W. Vaughan, president of Curtiss-Wright since 1935 and president of Wright Aeronautical Corp. since 1930, and associated with the two companies for 25 years, was elected chairman of the board of Curtiss-Wright Corp. In addition, he retains the office of chairman of the board of Wright Aeronautical Corp.

Paul Shields, a director of Curtiss-Wright and senior partner of the investment banking firm of Shields & Co., was elected chairman of the executive committee.

The company's recent developments in the aviation field include two new type power plants—the compound engine and the gas turbine—the Curtiss-Wright flight simulator and further refinement of the reversible pitch propeller which permits the "braking" of aircraft in flight. It also has under way experimental work with rockets and with jet and turbo-jet propulsion units.

Will Examine Statistics

Middleton, Ohio

• • • **John T. Anderson,** manager of the Commercial Research Dept. of Armco's Market Development Div., has been appointed chairman of a project committee by the Census Advisory Board of the U. S. Dept. of Commerce.

The committee will examine all production statistics collected by the U. S. Census Bureau and prepare standards for future operation, in order to give these statistics maximum value for all users.

▶ THE FASTEST THING IN FASTENINGS ◀

TINNERMAN
Speed Nut
Savings Stories

"Saved—$50,000 EQUIPMENT INVESTMENT ...Thanks to SPEED NUTS*"

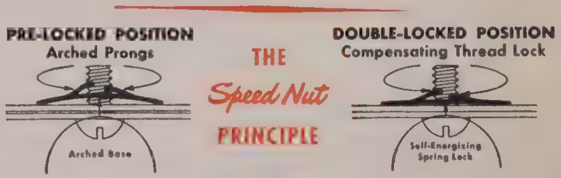
REPORTS MR. GEO. W. McINTYRE,
Sales Engineer, Walway Co., Detroit, Mich.

"Recently, a well-known automobile manufacturer asked us to estimate the cost of supplying radiator core supports for his 1949 models complete with welded nuts. Since we had no automatic welding equipment of the type required and were a considerable distance from the nearest source of high-voltage power, our investment in wiring and equipment would have been $50,000.00!

"With the help of Tinnerman engineers, we submitted an alternate estimate based on the use of heavy-duty, self-retaining 'U'-type SPEED NUTS. The customer accepted this proposal, gaining a 42.3% cost reduction over the welded-nut method . . . and saving the entire equipment investment."

In analyzing your production costs, remember that SPEED NUTS can save money for you, too. Write for details on our Fastening Analysis Service or contact your Tinnerman representative, listed in major city telephone directories. Tinnerman Products, Inc., Cleveland 13, Ohio.

In Canada:	Dominion Fasteners Limited, Hamilton
In England:	Simmonds Aerocessories, Ltd., Treforest
In France:	Aerocessoires Simmonds, S. A. Paris


PRE-LOCKED POSITION
Arched Prongs
Arched Base
THE
Speed Nut
PRINCIPLE
DOUBLE-LOCKED POSITION
Compensating Thread Lock
Self-Energizing
Spring Lock

Close-up shows heavy-duty "U"-type SPEED NUTS being slipped into bolt-receiving position by hand.

On the Walway assembly line, above, assemblers are attaching 21 "U"-type SPEED NUTS to each radiator core support. Completed product, right, is ready for final front fender, apron and radiator assembly.

TINNERMAN Speed Nuts

*Trade Mark Reg. U. S. Pat. Off.

MORE THAN 4000 SHAPES AND SIZES

Washington . . .

EUGENE J. HARDY

• German steel and coal industry reorganization planned . . . Trustees will take over operation of industries . . . Economists see higher wages, lower profits.

WASHINGTON — Pending final peace settlements, the US-UK Military Governments are taking interim steps looking not only to the eventual return of industry to German ownership but by which it is expected that both the steel and coal industries may better carry out their share of recovery responsibility.

Under decisions recently announced through the State Dept., two initial major moves are underway. One is the setting up of a trustee system which, in effect, returns the assets, operational responsibility, and exercise of control to Germans—under close watch by MG. The other move is a reshuffling or reorganization program for breaking up the prewar pattern of wide ownership by cartels and combines.

However, these activities will not apply to those undertakings in the steel and coal industry in which half or more of the share capital as of Sept. 1, 1939, were owned by Allied interests.

The reorganization program for the two industries has the approval of the State Dept. It is pointed out that where ownership was set aside after the war because of identification with combines or Nazis, management was made responsible solely to the military government.

"It is thus impossible for such plants to secure loans for the purpose of rehabilitation and many of them have been operating at a financial loss which has been made up subsidies indirectly borne by the United States," says Secretary of State Marshall. "Hence, it was necessary in the interest of Europe to reorganize under a pattern which would permit responsible enterprises to be under at least a substantive or responsible ownership."

In effect, fulfillment of the MG decisions (United States Zone of Control Law No. 75) will result in regrouping of large combines and property which were forfeited into smaller self-sustaining units. These would be placed under German trusteeship which in turn would be responsible to the MG. Assets would be allocated among the various enterprises in such a way as to get them on a sound financial basis as soon as possible.

THERE is little difference in this and bankruptcy proceedings except that the MG is applying it in a large way to a complicated industry in a major world production center.

Those enterprises in the two industries which are not subject to the reorganization plans will shortly be released from MG control. Owners of the mines or plants will then be able to resume normal operation except that the US-UK Coal Control Group will retain the right to channel coal distribution.

As to the collieries, those which come under the reorganization plan will be withdrawn or taken out from the parent organization and set up as new companies. The MG will decide which assets are to be allocated and transferred to each of the new companies.

Three to five German nationals will be appointed as trustees for each new company and they will hold shares of the company in equal amounts. These shares, however, are merely held in trusteeship for the owners who will be entitled to their proportionate share of ultimate disposal proceeds but who have no voice in operations.

In the case of the iron and steel industry, a somewhat similar procedure will be followed but this will consist of two phases.

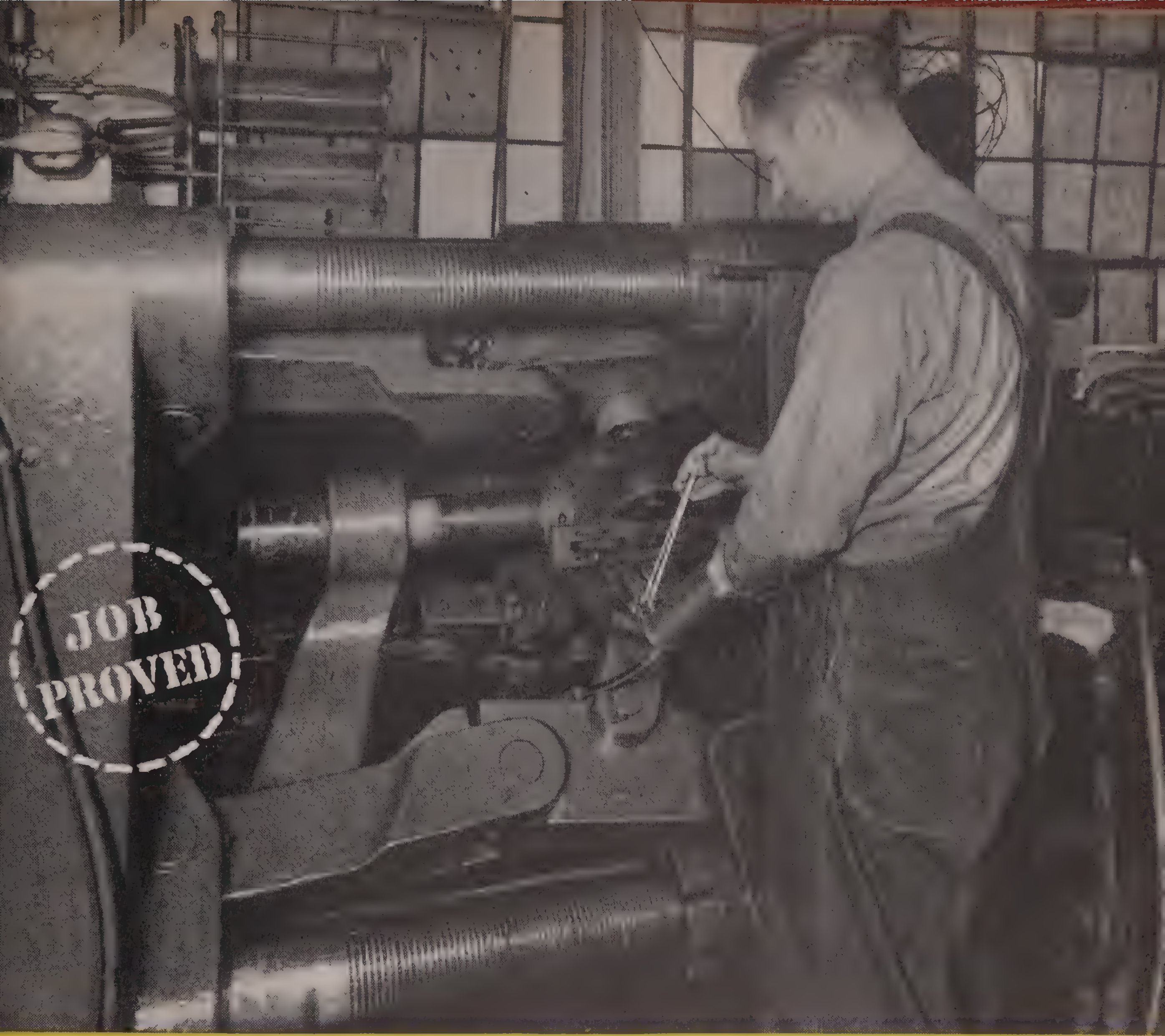
First, a steel trustee association consisting of 12 members will be appointed by MG in cooperation with the concerned German organizations. Shares and assets of the new companies which had already been formed to operate the steel-producing industry will be transferred to the association and the assets at present operated by such companies (including those held on lease) will be seized by MG and the title thereto transferred to the association.

LIKE the colliery set-up, the association will act as owners but will be prohibited from distribution of earnings or disposal of either shares or assets of any steel facilities. It is also subject to overriding authority of the MG through a Bipartite Steel Group agency.

When the new companies are formed, the second phase begins. As in the case of the collieries, trustees will be appointed for each of the new steel companies. The association will then take on the aspect of a trade association with a trustee from each plant being nominated as a member of the association. Powers of ownership, previously exercised by the association, now passes to the company trustees.

Carrying out of the program is likely to require a considerable period of time. For one thing, selection of trustees cannot be made hastily. In addition to obtaining competent persons, the MG will have to guard against returning to positions of control or ownership any persons formerly connected with Nazi activities.

Also, while the MG is committed to a policy of breaking up cartels



$300 SAVED IN "PIN" MONEY

Sun Lubricant Reduces Toggle Pin Wear 70% and Minimizes Shutdowns in Die-Casting Plant

In injection-molding zinc die castings, a manufacturer was experiencing excessive wear and breakage in toggle pins. The lubricant in use, which was applied to the pins by gun, just couldn't stand up under heavy-duty operation.

Asked for his advice, a Sun engineer recommended a grease which had been "Job Proved" in many machines of the same type. Over a period of 14 months, use of this Sun grease resulted in 70 percent reduction in breakage of pins. Translated into hard cash, this represented a $300 saving. In addition, costly shutdowns for pin replacement were greatly reduced.

Records like this are not unusual in plants where Sun "Job Proved" greases and oils are used. You can rely on these lubricants to help keep equipment operating steadily and safely, with minimum time-out for maintenance. For the booklet "What Makes a Good Grease," write Dept. IA-12.

SUN OIL COMPANY • *Philadelphia 3, Pa.*
In Canada: Sun Oil Company, Ltd.
Toronto and Montreal

SUN PETROLEUM PRODUCTS SUNOCO
"JOB PROVED" IN INDUSTRY

and large combines, it has to move slowly lest the opposite effect be accomplished and would find itself in the position of having abetted and fostered socialism and nationalization and fostered the continental trend toward socialism and nationalization of industry.

THERE are almost as many opinions as to the treatment to be accorded business next year by the White House as there are White House advisers.

But if the prevailing views of Chairman Edwin G. Nourse, of the President's Council of Economic Advisers, prove to be dominant, business men can breathe easier—for the time being.

Dr. Nourse points out that business men became frightened immediately after the November elections with stories about "a New Deal, a new orgy of spending, the fat's in the fire as far as business is concerned."

"I don't think this is so," Dr. Nourse said recently in an address before a meeting of the Machinery and Allied Products Institute. "I think the President has made it clear through me, through James Webb (head of the Bureau of the Budget) and through Secretary Sawyer that we are not going to spend blithely and carelessly."

For one thing, President Truman definitely believes in a balanced budget, Dr. Nourse said. "He definitely thinks that spending should be tailored to the nation's income, and I can tell you that he is deeply concerned about our $250 billion debt," he added.

Dr. Nourse pointed out that President Truman's current economic dilemma consists of the prospect of huge expenditures for defense and foreign aid on one hand and an obligation to reduce spending on the other hand. And excessive spending, he predicted, will mean (1) deficit financing, (2) new and higher taxes, (3) controls.

In the same vein, Robert Nathan, economist, told the MAPI meeting that he did not believe controls would be necessary if defense and armament spending could be held to $15 billion and foreign aid spending to $4.5 billion. But if there is to be tax reduction, he said, "we may very well need controls." If there is to be no tax reduction at this time, there is similarly no need for controls, he continued.

Although he said he believed the "major inflationary forces" have now spent themselves, he added that he had no doubt that a fourth round of wage increases would get through because "there are no signs that business is going to cut prices voluntarily."

Labor is going to point to excessive profits, he said. "The level of profits should be around $15 billion instead of around $20 billion as they are now, he said. And the threat of excess profits legislation should lend substantial aid to the fourth round argument, he added.

THE BULL OF THE WOODS BY J. R. WILLIAMS

OH, WHAT LUCK! IF YOU'D OF LEANED AGINST ONE OF TH' OLD MACHINES, ONE HALF OF YOU WOULD OF WENT AROUND WITH TH' BELT AN' THE OTHER HALF AROUND IN TH' GEARS!
THAT KID WAS DUMB ENOUGH TO OVEROIL HIS MACHINE, BUT QUICK-WITTED ENOUGH TO GET TH' BULL'S MIND OFF THAT!
THEY TEACH THAT NOW-- PSYCHOLOGY! BUT I'M AFRAID THEY'RE TEACHIN' 'EM HOW TO GET IN TROUBLE TO TEACH 'EM HOW TO GET OUT OF IT!
OIL
THE COVER UP
J.R.WILLIAMS
COPR. 1947 BY NEA SERVICE, INC. T. M. REG. U. S. PAT. OFF.

Management Lists Major Financial Difficulties

New York

• • • **Eight current** financial problems are considered of major importance by American industry, according to a survey of 1200 executives representing companies of all sizes and types of industry. The survey was made to determine subjects for discussion at the annual meeting of the finance division of American Management Assn. in New York Jan. 20 and 21. They are:

(1) The increasing difficulty of finding sources of funds to replace worn-out equipment at today's inflated prices and to provide for expansion.

(2) Public misunderstanding of the true nature and size of profits under today's conditions, and the increased need for retention of earnings to provide for plant replacement or expansion.

(3) Provision of adequate depreciation reserves under current tax laws and rising costs.

(4) The economic and financial implications of the government defense programs and foreign aid, and of the trend of inflation.

(5) The probable form and effects of future taxation.

(6) Accurately planning and controlling inventories.

(7) Quality of management as a consideration in extending credit by individual companies.

(8) The uncertainty of the future trend of interest rates in view of predictions of a scarcity of capital and evidence of a trend toward debt financing.

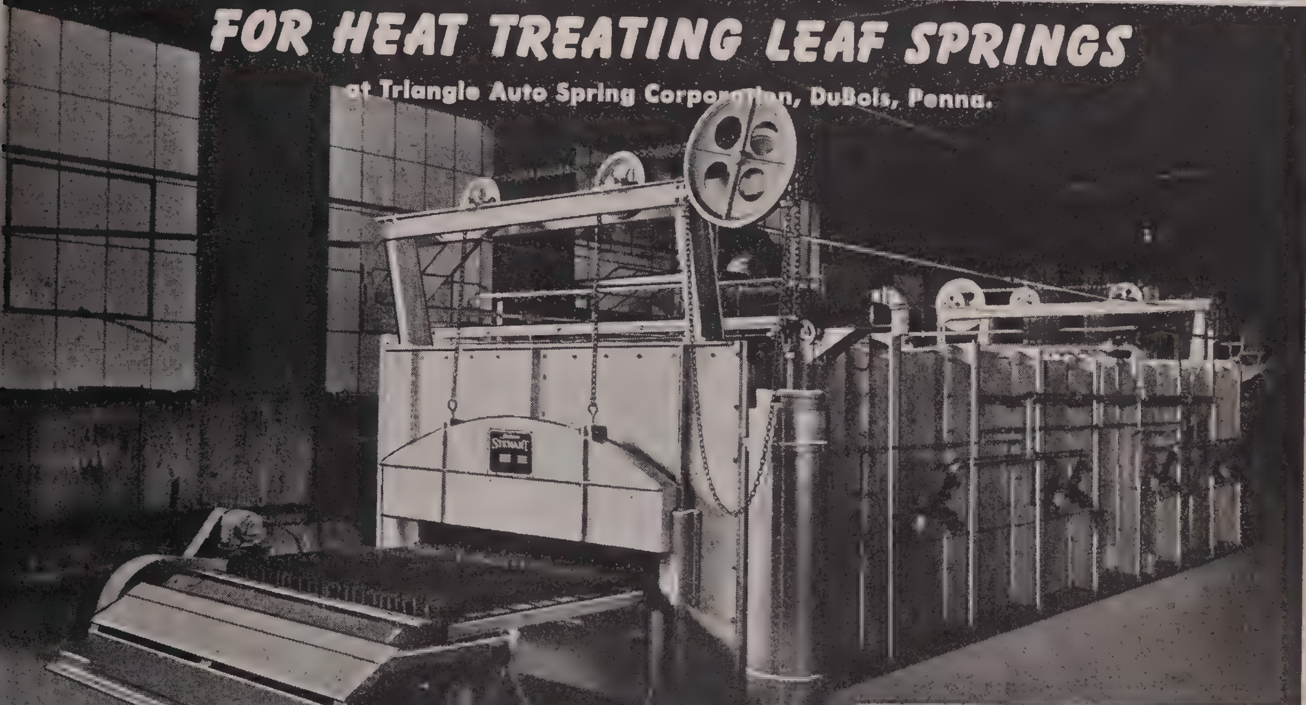
No. 87
of a
Series
of Typical
Installations

Sunbeam STEWART

THE BEST INDUSTRIAL FURNACES MADE

FOR HEAT TREATING LEAF SPRINGS

at Triangle Auto Spring Corporation, DuBois, Penna.

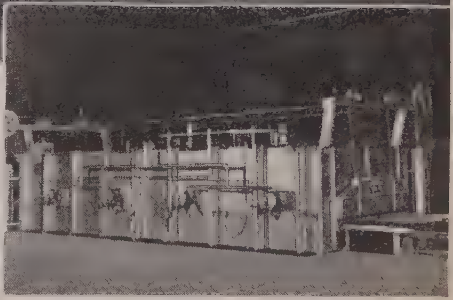


Discharge view of the Sunbeam Stewart Over-fired Draw Furnace used at Triangle. This unit is capable of accurately drawing 5000 lbs. per hr. All types of springs are manufactured from the smallest, 5 lbs. to the largest, 375 lbs. Usable heating space is 7″ high x 6′ wide x 28′ long.

Capable of drawing 5000 lbs. of leaf springs per hour, Triangle's Sunbeam Stewart Over-fired Draw Furnace obtains the exact physical characteristics to meet their close specifications. Duplication of results is essential since each leaf plays a distinct part in the way the complete spring reacts.

Proper spacing of burners and the tangential firing along the roof, together with a correctly designed heating chamber, assure uniformity in heat treatment. The traveling hearth speed can be varied from 5.6 inches to 22.4 inches per minute in accordance with the size and thickness of leaf springs being processed.

This installation demonstrates the quality and sound engineering of Sunbeam Stewart Furnaces designed to meet the specific requirements of the metal-working industry throughout the United States. In addition, Sunbeam Stewart builds a full line of standard furnaces.



Charging end of Sunbeam Stewart Draw Furnace. Heat treatment at Triangle is so exacting that practically no variations are allowed.

Assembling spring leafs. Triangle makes all types—smallest, weighing 5 lbs. to largest, weighing 375 lbs.

SUNBEAM STEWART INDUSTRIAL FURNACE DIVISION of SUNBEAM CORPORATION
(*Formerly* CHICAGO FLEXIBLE SHAFT CO.)

Main Office: Dept. 110, 4433 Ogden Ave., Chicago 23 — *New York Office:* 322 W. 48th St., New York 19 — *Detroit Office:* 3049 E. Grand Blvd., Detroit
Canada Factory: 321 Weston Rd., So., Toronto 9

A letter, wire or 'phone call will promptly bring you information and details on SUNBEAM STEWART furnaces, either units for which plans are now ready or units especially designed to meet your needs. Or, if you prefer, a SUNBEAM STEWART engineer will be glad to call and discuss your heat treating problems with you.

West Coast . . .

ROBERT T. REINHARDT

• Government owned metal plants on block . . . Douglas getting Pressed Metals Div. rolling . . . Kaiser breaks ground for new blast furnace . . . Aluminum shortage to become still more acute.

SAN FRANCISCO—There is considerable speculation as to whether the government will be successful in disposing of what many consider to be a valuable steel producing unit at Pittsburg, Calif., and a white elephant aluminum plant at Riverbank, Calif. through its latest offering.

Bids close Feb. 15 for the Pittsburg steel foundry which is now under lease to Pacific States Steel Corp. and operated by them to produce ingots for use at their Niles, Calif. rolling mills and for shipment to Inland Steel Co. This 5-ton electric furnace and two 25-ton openhearth operation was carried on under Columbia Steel Co. during the war and last May was leased by Pacific for 11 months with an option for renewal.

It is known that Pacific has expressed interest in continued operation but whether an offer to purchase has been made, has not been revealed.

The present operators expect to get as much as 400,000 tons of steel from the combined operations per year if sufficient scrap is available to maintain capacity.

Columbia has given no indication of renewed interest in this plant which is adjacent to their Pittsburg operations, but it is believed there will be no dearth of bidders for the unit which carries a "fair value" of $3,385,000 and which originally cost $8½ million.

There is certainly no sellers' market so far as aluminum reduction plants with a historic high operating cost and limited power available is concerned. The Riverbank plant built by Alcoa during the war is again up for sale with bids closing Jan. 10 and subject to control under the federal security clause which makes it mandatory that it be operated as an aluminum producer and not cannibalized.

Capacity of this unit is approximately 48,000 tons of aluminum pig per year and full operation demands a power supply of approximately 864,000,000 kw hr.

With power already short throughout the West it is inconceivable that a potential operator could negotiate a contract for that amount of electricity.

LOS ANGELES—With an eye cocked at the growing market for automobile parts in Los Angeles assembly plants of all major companies, Douglas Aircraft quietly has launched production in its new Western Pressed Metals Div. which is headed by former Convair chief Harry H. Woodhead.

Although Western's work thus far has been in the realm of small contracts with parts suppliers rather than with automotive companies, it has selected contracts which serve as pilot tryouts for various forms of automotive work.

With its tremendous facilities, including three large plants in different nearby cities, Douglas may move into position to handle body fabrication or at least major part construction as automotive companies in the Midwest make their assembly lines in southern California more self-sufficient.

Experts in pressed metals operations with imposing experience backgrounds in the automotive field are on Mr. Woodhead's staff. Whether these men will develop techniques to make it profitable to press out large body sections in the relatively small volume needed by West Coast assembly plants has been questioned. As inviting as it is, steel company officials in the West are inclined to believe they cannot look forward to such a sheet tonnage market locally because of the heavy investments necessary to produce large sections using present methods.

Although at the present time the Western Pressed Metals Div. is small, Douglas officials indicated that they could give the new unit 50 pct of their floor space if sufficient steel were available. A shortage of steel has been a definite handicap, although allotments from both Columbia and Kaiser have increased. Douglas expects more steel upon the completion of the Columbia mill at Los Angeles in about 2 years.

In one of the most significant pilot programs, Western has used Kirksite dies, similar to those used with aluminum for aircraft work, for the pressing of steel fenders and similar hard items.

Mr. Woodhead believes that he now has produced sufficient pieces to prove that Kirksite dies can be used successfully for steel, despite a general belief to the contrary. He has made metal stampings in quantity and at a reduced price with the aviation-type dies. The cost is 20 pct that of hard dies, he estimates, and greater speed is possible.

Some hard dies are used also by the company, but it now is pressing out successfully 10,000 fenders a month with Kirksite dies for California Parts & Supplies Co.

In the pilot process, Mr. Woodhead also is reeducating aviation personnel to the new functions in hard metal work.

Indicating the interest of the company, 70 pct of its work has been in the automotive field and 30 pct in such fields as plumbing (tubs and sinks), metal furniture

What happens to your drawings?

Is one drawing enough, or do you need copies?

lace your drawing on any one of the nany Ozalid sensitized materials, feed t into the Ozalid machine, and you will ave a positive (not negative) copy, dry-leveloped and ready to use, in a matter f seconds!

Do you change or make additions to originals?

nstead of altering or changing your riginal, do it on a translucent Ozalid rint. You can then combine as many hanged prints as you wish by putting hem on transparent Ozalid film, overaying them on a sheet of Ozalid sensiized paper, and processing!

Do you want drawings on different weight papers?

zalid papers are available in light, tandard, and heavy weights. You can ven make Ozaprints with reproductions n both sides of the sheet!

Do you want color coded drawings?

eproduce your drawings on Ozalid apers in black, blue, red or sepia on hite or tinted backgrounds. Color code rints for different departments . . . color ode different circuits, dissimilar lines or ymbols, etc. for greater clarity.

Do you need extra masters?

Make translucent Ozalid Intermediates directly from your tracings for use as "masters" in your printmaking. This saves the original . . . provides "masters" for different departments, branches, contractors, etc. (Ozalid Intermediates are actually better to print from than originals. They increase line density; can be made on new Ozalid plastic surfaces, impervious to stain and smudge.)

If you make drawings—or use them—Ozalid can save you time and money. Write today, and learn more about *how* Ozalid can tighten up lost time and money in your field.

ALL OZALID PRINTS PRODUCED IN SAME MANNER

- ★ **No tie-ups when you shift from one type of print production to another. Simply choose your Ozalid material . . . and your Ozalid Streamliner exposes and dry develops it. Standard work prints are produced in 25 seconds.**
- ★ **Your drawings can be up to 42 inches wide, any length. Roll stock or cut sheets can be used. (Special machines accommodate 54" wide drawings.)**
- ★ **You—or anyone else—can be the operator. A few hours and you're an "expert."**
- ★ **See *all* the Ozalid prints you make from any drawing . . . and learn full story. Mail coupon today.**

DEPT. NO. 213

OZALID A Division of General Aniline & Film Corp., Johnson City, New York

Gentlemen: Please send free copy of Ozalid Streamliner booklet illustrating all types of Ozalid prints.

Name__________ Position__________

Company__________

Address__________

Ozalid in Canada—Hughes Owens Co., Ltd., Montreal and trailer parts. Stress has been on engineering development.

Western now is concentrated in the Santa Monica plant of Douglas with the El Segundo and Long Beach plants used for a major share of the Army and Navy aviation contracts of the company.

Describing his new project, Mr. Woodhead says: "It's a healthy baby. We are rolling, welding and pressing metal and have presses from 5000 tons to punch size."

•

Better Business Outlook

Los Angeles

• • • **Manufacturers** and distributors of machinery in this area are taking encouragement for additional business from the Nevada mining areas as a result of a survey recently completed by Henry Mulryan, chairman of the Chamber of Commerce's mining commission.

According to Mr. Mulryan, Nevada mines are "in an excellent position to profit by the current high prices of metals." He points out that in Nevada production of gold, silver, copper, lead and zinc totaled $30,404,175 in 1947 as compared to $27,026,416 in 1946. Recovery of miscellaneous metals increased the 1947 total to $35,400,000 which is about one pct above the 1946 level.

Copper production in 1947 was up 26 pct from $15,751,584 in 1946 to $19,915,610. Income from lead mining increased 37 pct from $1,564,150 to $2,140,360 while silver improved 12.3 pct from $1,010,526 to $1,135,685. A reduction in gold income of 3.8 pct from $3,173,800 to $3,052,000 was reported and zinc dropped 24 pct from $5,526,356 to $4,160,520.

Increased mechanization is apparent according to Mr. Mulryan who, on his 3000 mile trip, reported that high operating costs and labor shortages are responsible for this trend. He found greater emphasis on open-pit service operations.

•

More Pig From Fontana

Fontana, Calif.

• • • **A supply of** an additional 438,000 tons of hard-to-get pig iron came a little nearer to realization last week as Kaiser Co., Inc., broke ground for the second blast furnace and announced that this stack was scheduled for completion by the end of 1949.

This furnace and the new battery of 45 Koppers-Becker coke ovens were announced last September as a $17 million expansion program.

F. M. Rich, vice-president in charge of operations, and George B. McMeans, general superintendent, and their wives participated in the ground breaking ceremony.

•

Industries Still Coming

Portland

• • • **Reflecting** a continuing industrial growth by year's end, this city will be able to report the establishment of 150 new industries employing 1600 persons. Included in the project announced for the immediate future is the expansion of the Vancouver Wash., plant of Aluminum Co. of America, at a cost of approximately $7 million. Approximately $1 million of this total will be used to remodel the present reduction plant and to install fume collecting devices and the remainder will be invested in a new unit to produce rods, bars and aluminum power transmission cable.

•

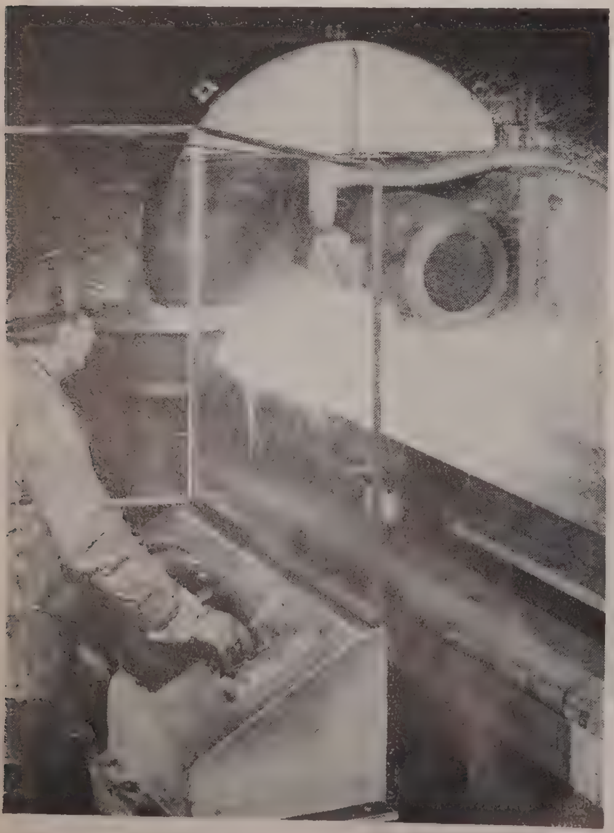
President Trouble-Shoots

Salt Lake City

• • • **Alden G. Roach** hardly had time to warm the chair in his San Francisco office as the new president of Columbia Steel Co. before he had to leave that city in the company of his vice-president and general sales manager, F. B. DeLong, in an effort to straighten out the complaints of local steel users.

Intermountain fabricators apparently are still unconvinced that their allotments from the Geneva plant are adequate and last week a meeting of the Utah Manufacturers Assn. included Col Jack Singleton, chief engineer of the American Institute of Steel Construction, and John Griffiths district engineer of AISC from Omaha.

Some digging into local information sources seems to indicate that steel fabricators are going to have a little difficulty in sustaining their claims that they are being bypassed. Reliable sources report that there is evidence to show that, on the whole, fabricators are getting as much or more steel as they indicated they might want before the U. S. Steel Corp took over the Geneva plant.

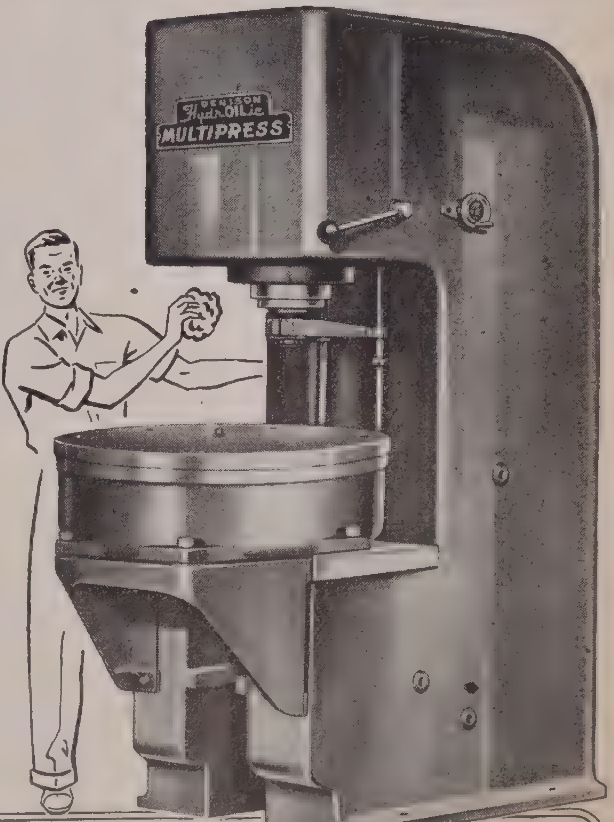


SPEEDY CUTS: *This is the first of several high speed friction saws to be installed in U. S. Steel Supply Co. warehouses. A 60 in. blade that travels at 1750 rpm is designed to make square burrless cuts across heavy steel sections.*

Good News

for your BIGGER JOBS!

25-ton MULTIPRESS* brings all the cost-cutting, production-boosting features of the famous bench-size models.



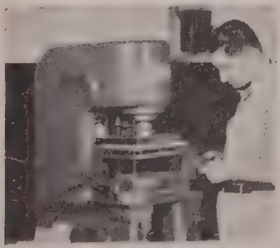
Now you can get *twenty-five tons* of the fast, oil-smooth production efficiency that has made the smaller, bench-size MULTIPRESS family so popular in industry. Its "feather touch" controls and quick, accurate, wide-range adjustability are ready to bring a full measure of cost-cutting, work-speeding MULTIPRESS action to your bigger jobs.

HIGHER PRODUCTION! Because you preset the stroke length, approach speed, pressing speed and pressure of the MULTIPRESS ram to the precise needs of each task, you get maximum operating efficiency—no waste motion. And the MULTIPRESS is *fast;* its ram delivers *controlled* power at speeds up to 530 ipm.

SAFE, EASY OPERATION! Easy-working hydraulic controls, operating at preset pressure limits through safe, dual hand levers, make this 25-ton MULTIPRESS simple to operate. Unskilled operators turn out production quality parts at full speed, right from the start. Adding the MULTIPRESS Index Table, or other feed devices, makes the job automatic!

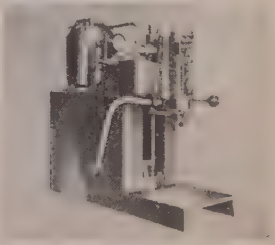
Wherever you need up to 25-tons of speedy precision on jobs that call for 25-ton pressure application, you'll want to weigh the *many* proved advantages of MULTIPRESS. Write today for the full story!

SERRATIONS are broached on small cams with this 4-ton Multipress. Parts are fed to the Multipress ram by the index table—a Multipress accessory—and pushed through cutting dies under the ram. This operator broaches 1600 cams per hour.



This 6-ton MULTIPRESS, equipped with electrically heated platens, performs a drawing operation on camera cases, and eliminates the need for presoaking the leather. Production rate is 18 to 20 cases per minute with a two-cavity die, manually operated

Flash is trimmed from pipe plugs on this 8-ton Multipress with HydrOILic index table. On the kick press used before 6,000 blanks were trimmed in a day. Now, the Multipress operators produce 19,000 blanks a day.



The Multipress Midget—a one-ton high-speed, oil-smooth hydraulic production tool—is ideal for small parts work. Dual "feather touch" controls minimize fatigue, increase safety, speed production and improve quality.

* REG. U. S. PAT. OFF.

THE DENISON ENGINEERING CO.
1158 DUBLIN ROAD · COLUMBUS 16, OHIO

DENISON
EQUIPMENT *for* APPLIED
HydrOILics

HydrOILics
INDUSTRY'S RIGHT HAND

PERSONALS

° ° °

• **Frank W. Bleiler** has been appointed assistant manager of sales, Milwaukee Spring Co., division of Illinois Coil Spring Co. in Milwaukee. Mr. Bleiler had formerly been connected with the Steel & Tube Div., Republic Steel Corp.

• **Robert L. Hartman** has been appointed production manager of Hanford Foundry Co., San Bernardino, Calif. Mr. Hartman had been associated with Utility Electric Steel Foundry for 14 years prior to joining Hanford. **Edwin C. Relph**, former production manager, has been named works manager.

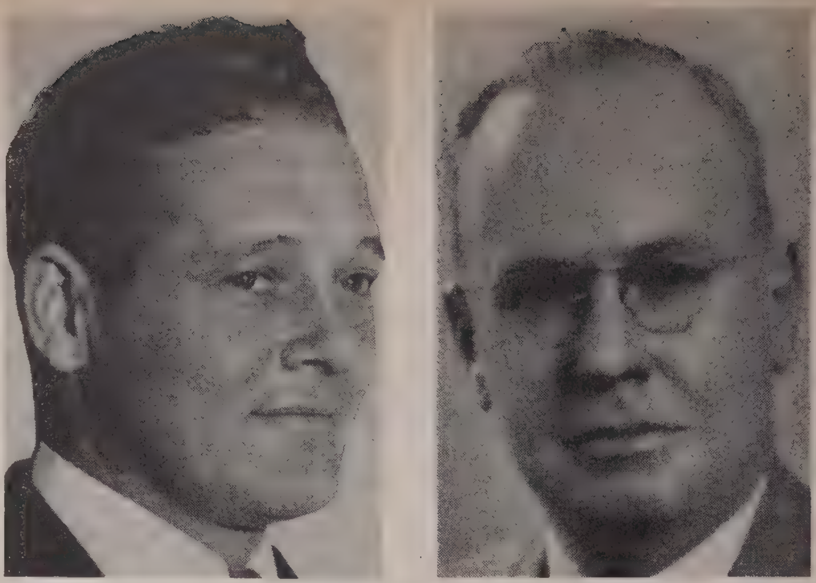
• **William J. Healey** has been appointed superintendent of transportation at the Brier Hill works, Youngstown Sheet & Tube Co., Youngstown.

• **Howard E. Hornickel** has been made assistant superintendent of the zinc works of the American Steel & Wire Co. at Donora, Pa. **Jesse K. Miller** has been appointed works metallurgist succeeding Mr. Hornickel, which duties he performs in addition to those of his present position as works chemist.

• **J. Carlton Ward, Jr.**, has been elected chairman of the board of the Stratos Corp. of Farmingdale, N. Y. a wholly-owned subsidiary of Fairchild Engine & Airplane Corp. **Lawrence B. Richardson** has been named president of Stratos and **Myron B. Gordon**, vice-president. **F. Eugene Newbold, Jr.**, has been named general manager.

• **Walter H. Stellner** and **Elmer H. Wavering** have been named vice-presidents in charge of merchandising and in charge of product design, respectively, Motorola, Inc., Chicago.

• **Webb R. Phillips** has joined Larkin Transformer division of Larkin Lectro Products Corp., New York, as chief engineer. He had formerly been associated with R. E. Uptegraff Mfg. Co., Inc., Moloney Electric Co. and General Electric.



JOHN P. WILKINSON (left), assistant to the president and JAMES M. LEWIS (right), manager of roll sales, Lewis Foundry & Machine Div., Blaw-Knox Co.

• **John P. Wilkinson** has been appointed assistant to the president and **James M. Lewis**, manager of roll sales, Lewis Foundry & Machine division of Blaw-Knox Co., Pittsburgh. Mr. Wilkinson comes to Lewis Foundry & Machine from Mexico City where he recently supervised the installation of a new merchant mill for Aceros Nacionales. Mr. Lewis has been with Blaw-Knox since 1931 and has been connected with the roll industry for 25 years.

• **W. T. Scharfenaker** has been appointed superintendent of the brick mason department of the Midland Works, Crucible Steel Co. of America, Pittsburgh. He had formerly been connected with the South Works of Carnegie-Illinois Steel Corp., Chicago.

• **M. L. Douglas**, and **Foster E. Fike** have been elected to the board of directors of Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y. **L. R. McWeeney** has been named vice-president and assistant secretary of the company. Mr. Douglas is manager of the plant at Coreopolis, Pa., Mr. Fike manager of the Rock Falls, Ill. plant and Mr. McWeeney is at the Port Chester plant.

• **Walter F. Schmid** has been appointed manager of the refrigeration department of the DeLaval Separator Co., New York.

• **Harald M. Olson** has been named consulting maintenance engineer for Morton Salt Co., Chicago.

• **Henry L. Marion, Edgar P. Dunlaevy** and **Weightman Edwards** have been elected vice-presidents of the Phelps Dodge Copper Products Corp., New York. Messrs. Dunlaevy and Edwards have been connected with the sales department of the corporation for many years. Mr. Brown has served as direct assistant to the president and in production control and coordination of operations.

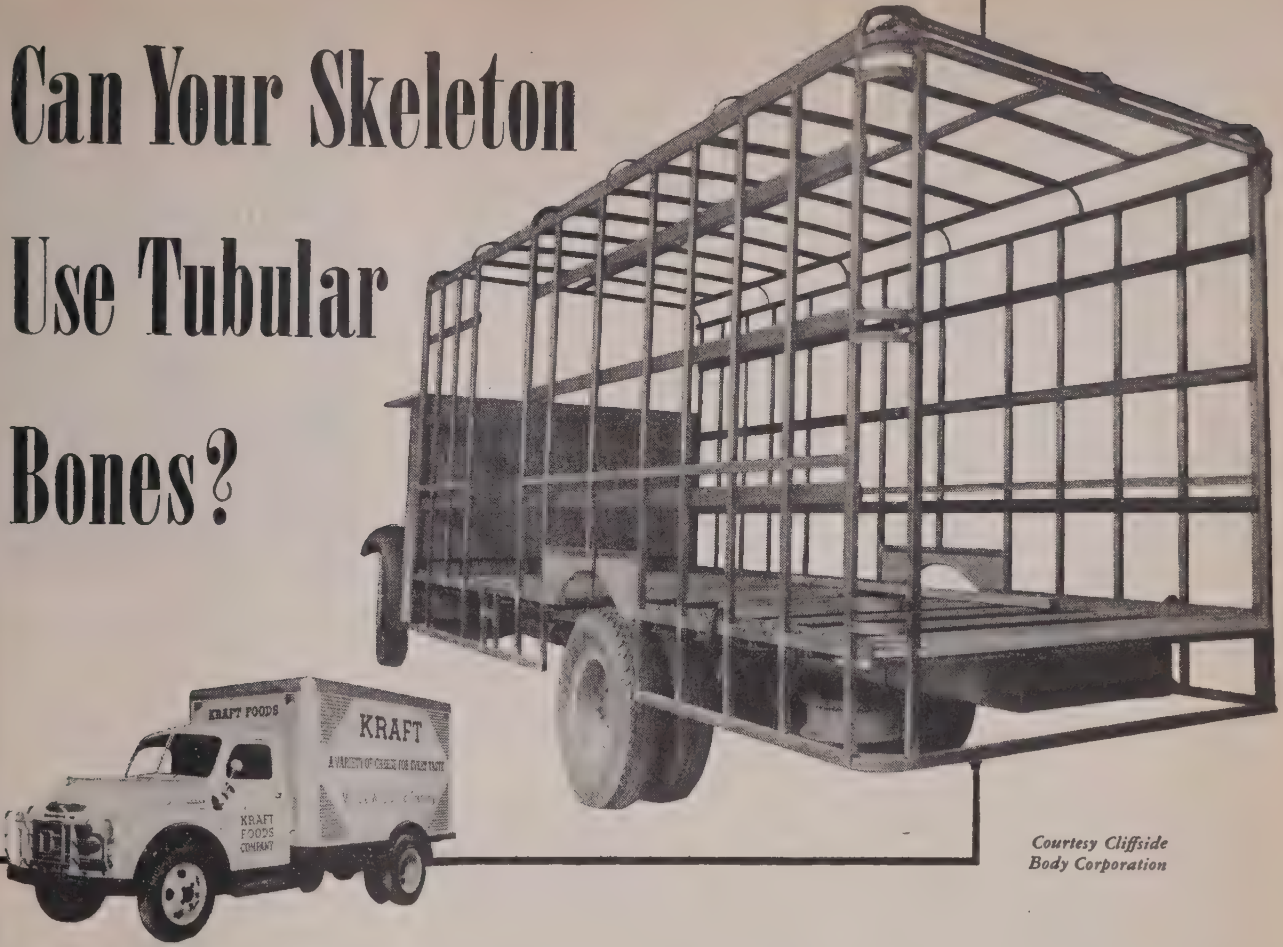
• **Sydney Shuttleworth** has been appointed assistant to the president and director, Union Fork & Hoe Co., Columbus.

• **Robert L. Halsted** has been named manager of the Allis-Chalmers Cleveland district office, succeeding **Arthur H. Wyman**, who died. Mr. Halsted has been manager of the Allis - Chalmers Charleston office since 1942. **James Mathews**, Charleston sales representative, succeeds Mr. Halsted as Charleston manager. Mr. Mathews joined that office of the company in 1946.

• **Walter K. Benchley** has been appointed purchasing agent of the Hewitt Rubber division and **William A. Fleischman** has been named purchasing agent for the Restfoam division, Hewitt-Robins, Inc., Buffalo.

• **H. O. Williams** has been named vice-president in charge of foundry production of I. S. Spencer's Sons, Inc., Guilford, Conn. Mr. Williams has been connected with the foundry industry for the past 30 years.

Can Your Skeleton Use Tubular Bones?



Courtesy Cliffside Body Corporation

The "bones" in this skeleton are square steel tubes, welded together to make a stiff, rigid frame. The idea, used here to form a truck body, is easily adapted – you may find it profitable.

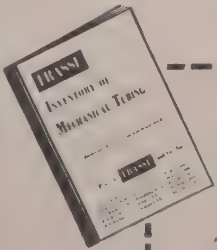
In this instance, the tubular construction, developed with the help of Frasse specialists, replaced a complicated system of bolted channels, gussets, cross fittings, angles and similar parts. Result? A stronger, more rigid, squeakless body—25% lighter, with more capacity for pay load . . . faster, neater assembly . . . greater flexibility of design . . . and 3 items to inventory instead of 60.

While mechanical tubing is widely used "to save machining the hole", it is equally handy for structural use. It pays—in product improvement, lower production cost, *often in material cost,* to think of tubing in your product.

And when you think of tubing, think of Frasse. Frasse stocks mechanical tubing, pressure and condenser tubing, stainless tubing—even stainless pipe and fittings. All grades are maintained in broad, convenient size ranges, and Frasse engineering service is just as handy whenever you need it. Call us. *Peter A. Frasse and Co., Inc., 17 Grand Street, New York 13, N. Y. (Walker 5-2200) • 3911 Wissahickon Avenue, Philadelphia 29, Pa. (Baldwin 9-9900) • 50 Exchange Street, Buffalo 3, N. Y. (Washington 2000) • Jersey City • Syracuse • Hartford • Rochester • Baltimore*

Send for this FRASSE *Tubing Inventory*

This handy booklet lists each mechanical tube size immediately available from Frasse warehouse stocks – a useful reference and purchasing guide. Send the coupon for your copy today.



FRASSE *for Steel Tubing*

Seamless and Welded Mechanical Tubing

Condenser and Pressure Tubing • Aircraft Tubing

Stainless Seamless and Welded Tubing • Stainless Pipe and Fittings

PETER A. FRASSE AND CO., INC. 221A
17 Grand Street, New York 13, N.Y.

Please send me a copy of your latest Steel Tubing Inventory.

Name .... Title ....

Firm ....

Address ....

WARREN H. WILLIAMS, Detroit district sales manager, Inland Steel Co.

• **Warren H. Williams** has been appointed district sales manager of the Detroit office of Inland Steel Company, succeeding **John H. Fitch,** who is retiring. Mr. Williams joined the company in 1935 as sales representative in Detroit and has been assistant district sales manager there since 1946. **Harris S. Currier** succeeds Mr. Williams as assistant district sales manager. Mr. Curier joined Inland in 1932 as mill representative in Detroit and in 1941 was appointed sales representative.

• **G. W. Merrefield** has been appointed consulting engineer to the foundry industry by the firm of Giffels & Vallet, Inc., Detroit. Mr. Merrefield served in similar positions with U. S. Steel Corp., Clark Equipment Co., American Radiator Co., and Chicago Hardware Foundry Co.

• **William A. Beatty,** has been appointed manager of the Feeder Div., Westinghouse Electric Corp., Pittsburgh. Mr. Beatty joined Westinghouse in 1916. He was appointed superintendent of the Feeder Div. in 1945 and became manager of manufacturing the following year. **Leonard H. Loufek** has been appointed industrial manager of the Central District for Westinghouse, succeeding C. H. Weaver. Mr. Loufek had formerly served as assistant industrial manager of the Central District.

• **Lee Cameron** has been elected president and general manager of Superweld Corp., Glendale, Calif. **Walter T. Wells,** who formerly served as president and general manager, has been named chairman of the board. **S. S. Webster, Jr.,** has been named secretary. **Robert E. Jones,** vice-president, has been elected treasurer. **Harold C. Hill** and **William M. West** have been elected directors.

• **Leroy W. Beier** has been named to represent Cannon Electric Development Co., of Los Angeles, in the Chicago area, including northern Indiana, northern Illinois and eastern Iowa.

• **Alexander S. Moody,** commercial vice-president of General Electric Co., in charge of customer relations work in the northwestern states, with headquqarters in Portland, Ore., retired recently, after 42 years with the company.

• **Selden T. Williams,** vice-president of Scovill Mfg. Co., Inc., Brooklyn, has been appointed general manager of A. Schrader's Son Div. Mr. Williams joined A. Schrader's Son, Inc., in 1929 and in 1944 was appointed vice-president of the Scovill Company, in charge of manufacturing of Schrader domestic and foreign plants.

• **A. A. Bolik** has been appointed general sales manager of the Thunder Bay Mfg. Corp., Detroit. Mr. Bolik formerly had been associated with E. W. Bliss Co.

• **Russell L. White** and **Joseph J. Daniels** have been elected to the board of directors of E. C. Atkins & Co., Indianapolis, Ind.

• **Robert L. Reeves** has been appointed manager of store merchandising for the B. F. Goodrich Co., Akron, Ohio. Mr. Reeves has been manager of sales planning in the replacement tire sales division for the last two years. **Dale Kramer** has rejoined the company and has been assigned to the Auto and Home Supply department. Mr. Kramer has been connected with the company since 1933 and had been director of field sales personnel when given a leave of absence earlier this year.

FRANK G. LINCOLN, chairman of the board, Hy-Pro Tool Co.

• **Frank G. Lincoln** has been elected chairman of the board of the Hy-Pro Tool Co., New Bedford, Mass., a subsidiary of Continental Screw Co. Mr. Lincoln formerly served as vice-president in charge of sales of Morse Twist Drill & Machine Co.

• **John F. Marsellus** has been elected president of the Marsellus Casket Co., Inc., Syracuse, succeeding his father, **John C. Marsellus,** who has been made chairman of the board. **Richard W. Marsellus,** assistant treasurer, has been elected treasurer.

• **Robert T. Hazell** has been named vice-president of the Fruehauf Trailer Co. of Canada, Ltd., Toronto.

• **T. H. McConica, III,** has resigned from the magnesium division of Dow Chemical Co. Dr. McConica is devoting full time to his duties as manager of the American Ski Co., Clare, Mich.

• **D. M. House** has been transferred to the Los Angeles zone of the Pontiac Motor division of General Motors Corp., Pontiac, Mich., replacing **R. J. Cutri,** who has resigned. **L. H. Holmes,** manager of the Buffalo zone has been transferred to the Atlanta zone replacing Mr. House. **E. M. Krotine,** assistant manager of the New York zone, has been promoted to manager of the Buffalo zone, replacing Mr. Holmes.

A. W. PINGEL, industry manager, Industrial Parts Div., Reynolds Metals Co.

• **A. W. Pingel** has been appointed industry manager of the newly-formed Industrial Parts division Reynolds Metals Co., with offices at Plant 14, Louisville. Mr. Pingel formerly served as assistant sales manager for Revere Copper & Brass Inc. **John E. Wells** has been named special sales representative of the Industrial Parts division with headquarters in Reynolds Detroit office. Mr. Wells formerly had been associated with Avco Mfg. Corp.

• **Claude M. Lamb** has been appointed sales manager, Industrial V-Belt division and assistant to vice-president in charge of mechanical sales, Dayton Rubber Co., Dayton. **R. S. Gove** has been named to succeed Mr. Lamb as New York district sales manager. Mr. Gove has been a field representative, industrial division, in the New England territory.

• **Thomas C. Shreve** has been appointed consultant in the manufacturing field for McKinsey & Co., New York. Mr. Shreve's last positions were with K. W. Battery Co. and General Electric. Co.

• **Ray H. Stuff** has been appointed sales manager of the Nox-Sound division, Nox-Rust Chemical Corp., Chicago. Mr. Stuff had formerly served as sales manager of a specialized division of the A. O. Smith Corp.

• **Harry R. Lehman** has been appointed factory manger and **Joseph A. Nagelberg** has been made purchasing agent, Cribben & Sexton Co., Chicago. Mr. Lehman formerly served as vice-president of Adel Precision Products Corp., Burbank, Calif. Mr. Nagelberg joined the company in 1942 and has served as assistant purchasing agent since 1947.

• **Arthur R. Munson** has resigned as general sales manager of the Lisk-Savory Corp., and has been made a director and sales manager of the Lord-Taber Co., Inc., Canandaigua, N. Y.

• **Harry Crump** for the past year manager of cutting tool sales engineering, Carboloy Co., Inc., Detroit, has been named assistant to the sales manager. **J. S. Gillespie,** formerly in charge of wear parts sales engineering, has been appointed manager of tool and wear parts sales engineering, succeeding Mr. Crump. **A. F. Dobbrodt,** formerly special products sales engineer, has been advanced to manager of mining sales engineering.

• **Sigmund Salacinski** has been appointed manager of the metals department of the U. S. Foreign Corp., New York. He had formerly been associated with the Metal Export Co.

SIDNEY A. WHITT, vice-president of engineering, Cordley & Hayes

• **Sidney A. Whitt** has been named vice-president of engineering for Cordley & Hayes, New York. Mr. Whitt has been director of engineering for the company for the past four years, and had formerly been associated with Nash-Kelvinator Corp., Fedders Mfg. Co. and Baker Ice Machine Co.

• **Frank T. Settle** has been appointed field sales engineer for the Fred H. Schaub Engineering Co., Inc., Chicago.

OBITUARY...

• **Walter D. Monroe,** 59, founder and president, Chicago Steel Service Co., Chicago, died Nov. 30.

• **John N. Goddard,** 81, president, Conklin Tin Plate & Metal Co., Atlanta, died Dec. 9.

• **Howard P. Zeller,** vice-president, Jamison Coal & Coke Co., Greensburg, Pa., died Dec. 10.

• **Emmett N. Owens,** assistant chief inspector, Ensley Steel Works of the Tennessee Coal, Iron & Railroad Co., Birmingham, died Dec. 11.

• **A. L. Sonnhalter,** formerly vice-president, Crucible Steel Co. of America at Midland, Pa. died recently.

• **Edward M. Johnston,** 53, sales representative of the Ingersoll division, Borg-Warner Corp., Chicago, died recently.

• **John S. Oursler,** 80, retired vice-president, Carnegie Steel Co., Pittsburgh, died recently.

• **Charles T. Schwab,** 45, assistant to the vice-president, Midland Works, Crucible Steel Co. of America, Pittsburgh, died Dec. 11.

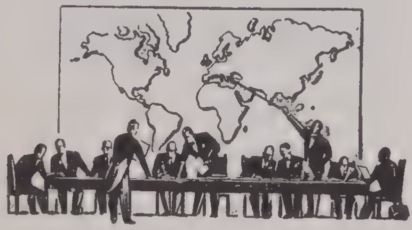
• **Benjamin E. Schwartz,** 52, senior member of the General Tinplate Co., Brooklyn, died Dec. 13.

• **Henry J. Hughes,** president, Robert Pinkerton Boiler Works, Green Island, N. Y., died recently.

• **Edward P. Dawes,** 48, production supervisor, Elmira Works, General Electric Co. at Elmira, N. Y., died recently.

European Letter . . .

• Cominform subverting Tito's regime from within . . . He faces complete loss of power, possibly his life . . . Communistic program probably modified in Yugoslavia and its achievements indefinitely postponed.



LONDON — Six months have passed since the Cominform denounced Tito. Yugoslav policy remains linked to that of the Soviet Union and Mr. Bebler's speeches before the United Nations are no less obstructive and insulting to the western Powers than those of Mr. Vyshinsky. Yet Moscow continues to condemn the Yugoslav regime, and in a speech recently Mr. Molotov again denounced the "treachery" of the "nationalistic Tito clique."

Yugoslavia's "popular democratic" neighbors have not confined themselves to words. The Rumanian government seems to have been implicated in the attempted escape of General Jovanovic and has exerted pressure on Yugoslav diplomats in Bucharest and on the Yugoslav minority in Rumania to disown Tito. Those who have refused have, according to Belgrade, suffered persecution. The Hungarian government is reacting in the same way to Yugoslav diplomats in Budapest, and a major of the Hungarian political police stated that Yugoslavs possess no diplomatic rights. In Bulgaria, agitation against Tito's rule in Macedonia is growing, and is becoming steadily less distinguishable from the Great Bulgarian propaganda of the prewar regime. In Albania the Communist Party has been purged, and Koci Xoxe, the former Minister of Interior and police chief, has lost his job and been disgraced for pro-Tito deviationism. These are signs that the Moscow dictated hostility of the neighbor satellites is a serious matter for Tito. Perhaps even more serious are the admitted difficulties in obtaining vital imports from the more distant and more industrialized satellities, Czechoslovakia and Poland. In a speech this week Tito complained that the eastern states were treating Yugoslavia's people's democracy worse than they have treated the capitalist states.

IT MAY be taken as certain that the Cominform's agents are doing their best to subvert the Tito regime from within. As long as Tito maintains an iron dictatorship based on the Soviet form of Marxist ideology, their task will be facilitated. They can count on the sympathy of the small number of veteran Yugoslav Marxists and of all unprincipled careerists who have joined the party for personal gain. The latter, who have always been numerous in all Balkan states under all regimes, will no doubt go over to the big red battalions as soon as it seems safe. Tito's friend, Rankovic, firmly controls the secret police, but it cannot be easy for him to decide whom he can trust. It is in fact only too likely that in Tito's own entourage there is treason: it would be surprising, in view of the past history of Communism in general and of Serbia in particular, if there were not.

Reprinted from the London Economist by special permission.—Ed.

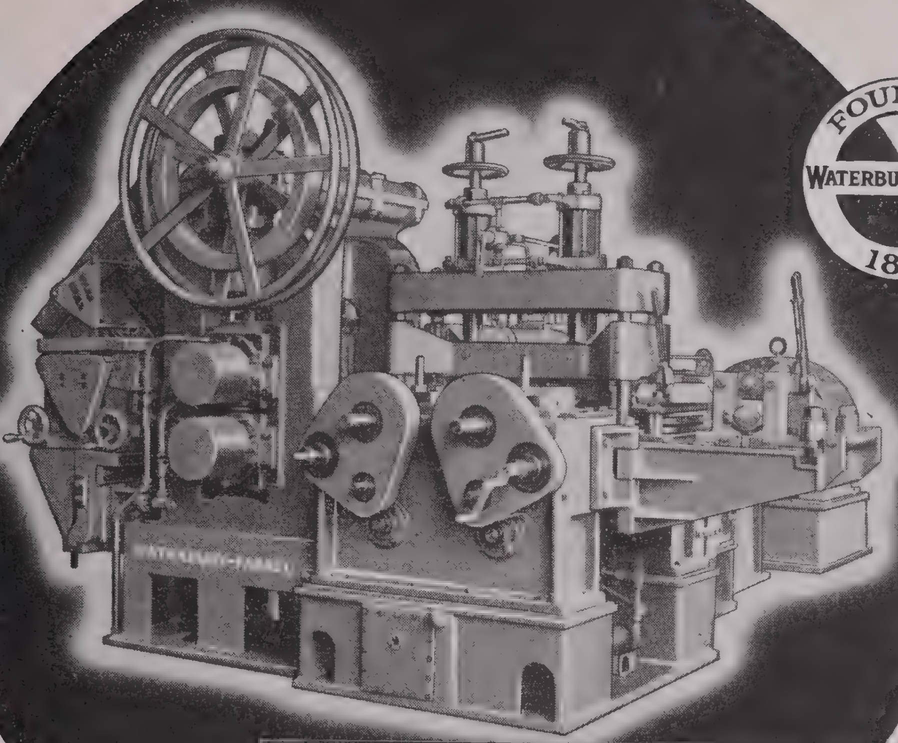
Meanwhile, material conditions are bound to deteriorate. The Five-Year Plan was too ambitious even for the most favorable circumstances. The results of linked prices, by which peasants were to be supplied with manufactured goods, have been disappointing. The boycott of the satellites is turning into a blockade, and yet the Yugoslav government still refuses the minimum concessions required for trade with the west. If present trends continue, there is real danger of internal disintegration, leading through mutiny and treachery to civil war and enabling the Soviets or the neighbor satellites to intervene to restore order.

Tito is too sharp a politician not to see these dangers, and though he has shown no sign that he wishes to be reconciled with the western Powers, it is improbable that he has not given the matter some thought. What in fact are the practical possibilities of a *rapprochement?* One possibility must be at least discussed before making an assessment of Tito's chances. If Moscow expected war, it might make temporary concessions. Tito on his side might for a brief period cooperate with the west solely in order to raise his own price. When the time came, Moscow, needing him for war, would accept him as an ally, and he would for the second time betray the west. Cooperation leading to this result would be a bad bargain for the western Powers—and for Tito. It would be a bad bargain for Tito because, once Soviet troops had entered Yugoslavia in the course of military operations, a way would be found to liquidate the Marshal. If, however, Moscow has no thought or expectation of war, Tito has only one thing to hope from the Kremlin —and that is the acceptance of his complete capitulation. The consequences of such action must obviously be known to him. He would disappear from the political scene, and perhaps from this world. The history of Communism shows that such capitulations are possible. If it is proved expedient that one man should perish for the good of the Party, the one man may willingly accept his sentence. But Tito does not seem quite the type of Party fanatic who has been capable of such self-abnegation in the past.

There thus seem to be two alternatives before the Marshal.

(CONTINUED ON PAGE 130)

FOUNDED
WATERBURY FARREL
1851



BAR FINISHING MILL

Variable Speeds up to 360 feet per minute, or more

- **Up-to-the-minute design.** . . . .
- **10-¾″ diameter rolls.** . . . .
- **Combination Coiler-Straightener.** . . . .
- **Double Edger with Hydraulic Hold Down** . . . .
- **and other outstanding features.** . . . .

If your problem is Mill Equipment for light gage steel or for non-ferrous materials, be it —

SHEETS • STRIP • WIRE • ROD • SHAPES OR TUBES

Let's Talk It Over! We are sure we can help you!

Waterbury Farrel

FOUNDRY & MACHINE COMPANY
WATERBURY • CONNECTICUT • U.S.A.

• **ALLOY STEEL**—No change in the alloy steel sales picture is reported in the cards for the next few months. Demand still exceeds supply, particularly in bars. Three sections of the voluntary allocations programs concern alloy users: military orders, freight cars and mining machinery, the latter not due formally until March. One of the big producers has already opened second quarter books with customers due to get about the same as they will in the first quarter. Others will open second quarter books soon. Demand appears smoother with less tendency to try to build up big stocks, but like all products, customers haven't yet shown any desire to take less than they can get.

• **EXTRA CARD**—Effective Dec. 20, Armco Steel Corp. began using a new card of extras for gage width and pickling of heavy hot rolled sheets and hot rolled strip. Revisions were also made in gage and width extras on cold rolled sheets in 17 gage and heavier and on enameling iron 15 gage and heavier. Base prices of these products remain the same. J. A. Ingwersen, vice-president in charge of distribution, said the adjustments were made to correct inequities in price structure of the items involved.

• **RAIL INCREASE**—This week, Colorado Iron & Fuel Corp. announced that they had raised the base price of rails from $3.35 per 100 lb to $3.50 per 100 lb, effective Nov. 22. This means that new price prevails f.o.b. Minnequa, Col.

• **MYSTIC PIG IRON**—The Mystic Iron Works of Everett, Mass., has increased the price of pig iron, effective Jan. 1, 1949. The new price for No. 2 foundry iron is $52.75 per ton against the current price of $49.50 a ton. The $3.25 advance is based on higher payroll and raw material costs.

• **HOT ROLLED EXTRAS**—Youngstown Sheet & Tube Co. has advanced hot rolled sheet and strip extras. The average boost, according to customers, is about the same as those made by Jones & Laughlin and Republic. Details, like those on all hot rolled sheet and strip extra increases during the last few months, vary. Sheet & Tube for instance, has more divisions in width extras than most of the others.

• **PIPE DEMAND**—Pipe will probably carry off the honors for the "tightest product of the year" again in 1949. Producers are booked up into 1952 on line pipe for oil and gas companies report no dip in demand for standard pipe. Next year's production in pipe and tube mills will be higher. Republic has added about 100,000 tons of annual production capacity at Gadsden, in 20 to 30-in. diameters, boosting the nation's capacity by more than 25 pct in these larger sizes. National Tube will bring in a 300,000-ton mill in the spring. Youngstown's Sheet & Tube Fretz-Moon continuous buttweld mill is a year and a half from completion.

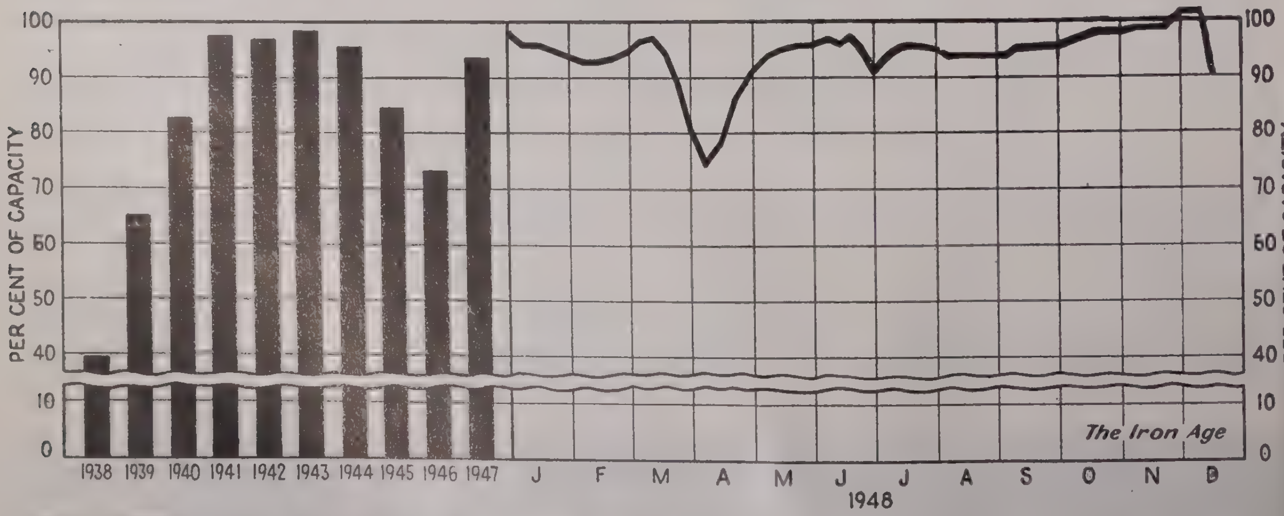
• **A QUICKIE CAUGHT**—Customs officials in Chicago are trying to collect $100,000 duty on foreign aluminum reaching here from England, Holland and Belgium. They charge that 2500 tons of pigs and ingots were billed as scrap when it was actually useable virgin material. The material was in cases sawed in half. Settlement may revolve around Section 562 of The Tariff Act which lists permissible manipulations.

• **WAREHOUSEMEN'S ANSWER**—Effective Dec. 20, Carnegie-Illinois Steel Corp. and American Steel & Wire Co. reduced quantity extras on their stainless steel products. Details had not been completely worked out at press time but it is understood the reductions will average approximately 5 pct.

• **WINDY WATERS**—Chicago is leaning more and more on water transportation. Last winter if it hadn't been for barge shipment of fuel oil through the Illinois waterway many Chicago homes would have been cold. Railroads are losing 25,000 carloads of revenue a year to this fast growing water movement.

• **APPLIANCES EASE**—Figures are now coming in to the extent of how far appliance sales have actually slipped. In November standard size vacuum cleaner sales totaled 9.5 pct less than October and were 27.2 pct less than November last year. Sales for first 11 months of '48 totaled 3,086,969; 1917 was 3,427,433 compared to 2,289,441 for entire year of 1946.

Steel Ingot Production by Districts and Per Cent of Capacity



Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
Dec. 14	99.0*	100.5*	94.0	98.0	100.0	105.0	100.5	103.0	105.0*	104.5	107.0	91.5	98.0	105.0
Dec. 21	83.5	86.0	82.0	93.0	93.5	105.0	89.0	100.0	102.0	104.0	107.0	89.5	90.0	90.0

* Revised.

Industrial News Summary

- ***Steel Price Boosts Depend on Costs***
- ***If Wages Go Up So Will Steel Prices***
- ***Output of Steel to Stay at Top Level***

STEEL people know as well as anyone else that prices are too high; that more increases in steel may price this product out of some markets. Knowing all this steel firms will still have to increase prices again if wages go up in 1949. The only reason further boosts have not been made in base prices is because economies and better utilization of equipment have kept rising steelmaking costs in check.

For the near future there is not a chance of any across-the-board, or general, increase in the base price of steel products. Adjustments which are made will come in extra charges which are being revised as costs dictate a higher return. Most of the extra changes recently have come about because of increased prices mills have paid for raw materials needed to produce coated steel items.

One thing is certain—there will be no general reduction of steel prices next year. And for that reason those holding steel inventories have no fear of losses because of holding this material. Steelmaking costs are not as flexible as they were 10 years ago. They are not flexible at all. And what worries most steel heads is the $64 question, "How will the industry in years to come get the money to buy new plants or replace old?"

The worries of the steel industry are not shared by steel labor. Next year will be its last chance for some time to go after a large raise—not in cents per hour but in lasting benefits. Steel labor will come out strong before next July for a wage increase, a social security package including bigger and better pensions and insurance. The last two items mean as much in terms of bigger steelmaking costs than any other wage raise.

The United Steelworkers' union will be militant on the matter of a social security package. According to them it is long over due. Progress has been slow. But before the next contract period rolls around next June some steel firms will have an idea of what they will do. So will labor have an idea of what they will do.

WHETHER or not steel labor gets more than a moderate increase in wages, the real stumbling block could be the social security plans which will be demanded. On this item alone the union has the right to strike. It had been thought that it would not strike for such a concession. That is no longer a generally held opinion. With chances of the Taft-Hartley Bill being changed and the "1949 or never" it can be expected that social benefits will be fought for—just as hard as wages have been in the past.

There is now no reason to believe that steel will strike in 1949. But there is every reason to expect a work stoppage if a wage-social-benefit impasse turns up at midyear. The cost of living will effect the demand for wage increases but it will not change one iota the drive for permanent benefits such as insurance, hospitalization and pensions.

Steel will pour out of furnaces and plants between now and the middle of 1949. If there is to be a work stoppage in steel it will not hit till after midyear. Demand for steel will have a direct bearing on the position steel firms will take on labor demands. Right now steel officials believe prices are high enough. Yet it is a sure bet that if wages go up so will prices.

Steel firms have more to face than just wage costs alone. Raw material costs are still slowly rising. Freight rate increases look like a sure thing for next year and equipment prices are not slated for a decline. In the face of these items alone steel will find costs higher next year.

THE sad thing for steel people is the realization that present profits—some of which are being used for expansions and replacements—are dependent to a large extent on the present high rate of output. If there is to be any drop in output late in 1949 there will be a corresponding drop in profits—or a sharp rise in steelmaking costs. It looks like a tug of war between steel and labor in the latter part of the second quarter of 1949.

There is no sign this week of any weakening of overall steel requirements. Nor is any expected. Sheet users are in for a surprise next year when more and more new equipment will be putting out sheets at a rate far surpassing anything the industry had hoped for.

Steel output this week is estimated at 90 pct of capacity, down 10.5 points from last week. There is nothing now that indicates a steel rate any lower than near capacity for months to come.

On the scrap horizon it can be expected that buyers will do everything they can to batter down prices. Scrap has always been a sensitive item. But this week there is no sign that buyers will soon have their way with lower quotations.

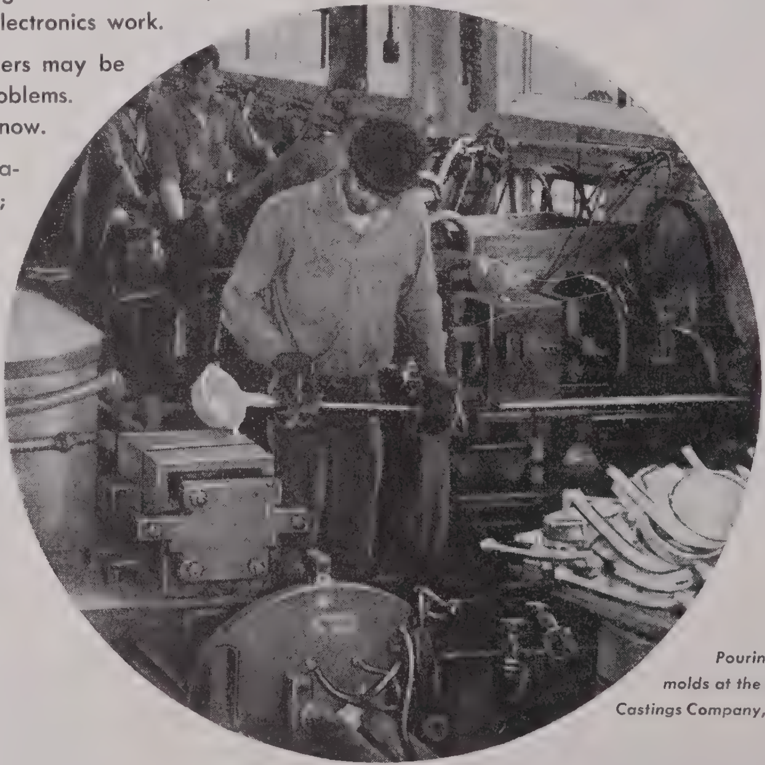
High Temperature Lubrication...400°F. and up!

Clean parting of castings from permanent molds is an important demand of efficient foundry operation. The Arrow Aluminum Castings Company, Cleveland, Ohio, gets better mold reproduction, longer mold life, easier parting and smoother surfaces on its castings by coating permanent molds with "Sono-Graph", a mold wash produced with **"dag"** colloidal graphite by the Mealey Grease and Oil Company, Cleveland, Ohio.

In countless other industries too...*wherever high temperature lubrication is a problem* ... one of the many **"dag"** colloidal graphite dispersions is the likely answer. This extremely versatile substance can also be used in opaquing, in general lubrication, in impregnating and in electronics work.

Acheson Colloids engineers may be able to help you with your problems. Clip the coupon and mail now.

Acheson Colloids Corporation, Port Huron, Michigan; Boston; New York; Philadelphia; Pittsburgh; Cleveland; Detroit; Chicago; St. Louis; Los Angeles; San Francisco; Toronto.



Pouring into permanent molds at the Arrow Aluminum Castings Company, Cleveland, Ohio

Send us information on "dag" colloidal graphite dispersions for:

General lubrication ☐
Extreme (high or low) temperature lubrication ☐
Parting ☐
Impregnation ☐
Electronic applications ☐
Opaquing ☐

LL-1 [illegible]

Acheson Colloids Corporation

Port Huron, Michigan

dag
REG. U.S. PAT. OFF.
COLLOIDS

Jobbing Foundries Bearing Brunt of Year End Slump in Castings

Tonnage Shops Still Doing Well; Slump Called Move To Adjust Inventories

° ° °

New York

• • • **Gray iron** foundrymen are concerned about a decline in casting order backlogs. While this decline is spotty, it has in many instances reduced foundry operations to a 3 or 4 day week. These are the salient points revealed by a nationwide check of foundry operations conducted by the editors of THE IRON AGE.

The first signs of the development began to appear some 3 months ago. But foundrymen mostly discounted the signs. They had been lulled into a false sense of security by longterm heavy backlogs.

Even now the order situation is spotty. Some foundries in every area of the country are still doing a heavy business. Foundries catering to the automotive industry are generally in a good position.

Jobbing foundries have borne the brunt of the order decline. A contributing factor has been the decline in the casting requirements of production foundries. This has caused them to withdraw some business from jobbing foundries in order to continue their own operations at the maximum rate.

Until recently some foundrymen, watching their backlogs evaporate, wondered whether others too were losing orders. It is true that there has been a good deal of shopping around lately by customers in search of higher quality castings. Patterns have been moving from shop to shop. Customer grumbling about machining losses due to poor castings is reported to be mounting—and rejections increasing.

One of the commonest explanations of the order decline is that customers have been leveling off inventories for the year end. Heavy inventories were formerly thought necessary as protection against long delivery periods. Foundrymen say that inventory-conscious buying is a feature of normal foundry business that has no significance on first quarter volume.

One New Jersey foundry was appalled when it discovered that its backlog of 6 months or more had dropped within 6 weeks to less than a month. It promptly reduced its 5-day week to 4.

A New England foundryman attributes the decline to the "year end easing off." He says the industry has been expecting defense orders but these have not materialized. Orders from textile machinery manufacturers have been slow for some time.

Philadelphia foundries report a general slowing down. Big casting consumers have stopped putting orders outside their own shops. One consumer which had been farming out castings to about 40 small foundries has now concentrated its business in four foundries. One big foundry in this area formerly farmed out casting business to the extent of 25 tons a day. Now these patterns are being brought back into its own shop. Another Philadelphia foundryman put it this way: "December blues are back again in the foundry industry."

In the Reading district one big foundry has cut its operations to a 4-day week. But it reports as big an order book for January and February output as it ever had.

The big pressure pipe foundries who take jobbing business have

Foundrymen's Chorus ! !

—GOT THOSE DE-CEMBER BLUES!
ARNOTT

suffered a drop estimated at 25 pct of their jobbing work. However, their pressure pipe backlogs are still very high. They say operations will continue at peak levels despite the seasonal layoff in pipe installations.

Most eastern foundries are in a better position for raw materials now than they have been for months, now that the Mystic furnace is operating and Swedeland is producing foundry iron again. Yet there is still a long term shortage of foundry iron. The foreign iron market in the East is all but dead, although some foundries still have stocks of foreign iron on hand. They use this sparingly. Foundries fear that steel producers, watching foundry business for the first signs of a decline, might switch their output from foundry iron to basic iron.

In Pittsburgh one foundryman described the declining business as "a purchasing agent's strike." "A technical correction for inventory purposes," said another. These men don't believe the dip in foundry orders reflects a real decline in their customers' business. They think purchasing men have adopted a "wait and see" attitude, hoping to get lower prices when they come into the market next year.

There is also a new and definite emphasis on quality. Now that some casting inventories have been built up buyers are getting tired of hearing poor quality castings blamed on bad coke, iron or scrap. They shop around for foundries that can produce to specifications. And they test to see that these specifications are held.

A number of smaller jobbing foundries have cut the work week from 6 to 5 days, a few work only 3 days a week. Yet other jobbing shops report business holding up well.

On the brighter side the big steel foundries working on basic steelmaking equipment, both in steel and iron castings, are going like a house afire. One of the biggest production foundries in Pittsburgh is planning to boost output by 40 pct next year. Foundries which produce the major tonnage of castings in this district report business is good.

There is a tendency, according to competent observers, to cry wolf because of the *number* of foundries that are hitting rough sledding, rather than considering the limited tonnage these foundries produce. Coming out of a lush sellers market into a buyers market, some companies are unprepared for competitive conditions. Until there are definite signs of a substantial tonnage drop, these observers choose not to get alarmed. They'll wait and see, with the prospect that order volume in the first quarter of 1949 will tell a more accurate story.

RECONSTRUCTION: *One of the three new storage tanks being built at the war damaged Shell Oil Refinery in Hamburg is shown in the photo. This is one of Northern Europe's largest refineries. Prewar capacity of the plant was 350,000 tons per year. This tank and the other two under construction will have an annual capacity of about 2.5 million gal.*

In the Midwest business is spotty too. Backlogs in two typical cast iron shops are down 60 pct from 6 months ago. Both of these shops are still running 5 days a week. But on many items they can promise delivery from stock. Malleable iron foundries, with the exception of the railroad shops, have not slowed down, but their backlogs are quite short, 2 weeks to a month. Foundries in the plumbing field are hoping that the spring building program will open up enough for them to increase their operating rate.

One of the largest steel foundries in this area, this one having five separate divisions, is still experiencing good operations, although backlogs — even in the strongest lines—are down to 2 to 3 months. In order to keep their operations going, they have had to change their products. They are making openhearth ingots for the steel conversion program.

On the West Coast the story is much the same. A check of the San Francisco Bay Area indicates that operations are down to about 60 pct capacity in many instances. The exceptions are the larger foundries, or those closely tied up with producers of industrial equipment—where job work is of lesser importance. Thus, on a tonnage basis, business is not as bad as it might appear at first look.

Job foundry backlogs are virtually non-existent beyond Jan. 1. One well informed foundry operator said, "business looks very dark for the immediate future after the 1st of January and the local situation has been made more acute because of the recently ended 3-month maritime strike which has had a dampening effect on ship repair and maintenance."

Cast scrap prices were weaker last week in most markets. Some of the slipping in quotations—which averaged around $1 a ton—was due to less demand from jobbing foundries. But better pig iron output and better supplies at larger foundries were also contributing factors.

Purchased Scrap Consumption at New High; Dealers Are Largest Single Source

Origin of Purchased Scrap

(In thousands of net tons)

Source	Tons	Pct
Metalworking	9,500	31.6
Railroads	4,000	13.2
Dealers	16,500	55.2
Shipbreaking	500	
Autowrecking	1,500	
Govt. surplus	500	
Farms	1,250	
Imports	350	
Gen. dealer	12,500	
Total	30,000	100.0

Washington

• • • **Purchased scrap** consumption by United States steel mills, foundries and chemical plants totaled more than 29 million tons this year, according to the Institute of Scrap Iron & Steel. This was 11 pct over last year's purchases and 20 pct more than what was consumed during the peak year of the war.

Best of all, consumers were able to increase their inventories by almost 1 million gross tons to a level 50 pct above that at the time of Pearl Harbor and slightly larger than the immediate prewar high.

During the year stocks of dealer scrap remained steady, although abnormally low compared with prewar standards despite record-breaking consumption and substantial consumption consumer inventories.

While consumption of purchased or open market scrap, largely provided by dealers, increased 11 pct this year, the melt of home scrap and pig iron barely topped 1947.

As a result the percentage of purchased scrap in the average steel furnace charge increased in 1948 to 27.4 pct compared with 24.5 pct in 1947. The average charge of home scrap was 25.9 pct compared with 26.2 pct in 1947, while the average percentage of pig iron used dropped from 49.3 pct in 1947 to 46.7 this year.

Of the 30 million tons of purchased scrap handled in 1948, 29 million tons was consumed and 1 million tons applied to mill inventories. About 9.5 million tons originated in metalworking factories as a byproduct of machining, fabricating and otherwise converting rolled steel products and iron castings into capital and consumers' goods, while the railroads marketed approximately 4 million tons, about the same as they provided last year.

Scrap dealers not only processed and shipped a substantial portion of this 13.5 million tons of industrial and railroad scrap, but also generated about 16.5 million from farms, auto wreckers, demolition, shipbreaking, government surplus and the general-run of collections that start with the one-horse alley-peddler.

It is difficult to break down the exact amount received from the categories, but approximate tonnages are estimated in the accompanying table.

It is estimated that in 1949 production of steel ingots will amount to about 92 million tons, while the output of castings will probably drop to 12.5 million tons.

Additional blast furnace capacity to make pig iron probably will not quite offset the increase in steelmaking capacity, nor will it enable iron foundries to return to their prewar balance of scrap and pig iron in their charges. Hence the requirement for purchased scrap in 1949 should increase slightly.

The supply of factory or industrial scrap will probably remain constant at about 15 pct of the total quantity of steel fabricated and 5 pct of iron castings machined, but show some increase as more steel becomes available.

A survey of leading railroads indicates they may offer about 250,000 more tons of scrap, an increase of 5 pct, in 1949, provided they get expected new rolling stock and track material.

Imports of scrap from China and Japan are slated to decline, but those from Germany will increase, possibly bringing total imports in 1949 up to 1 million tons.

Shipbreaking and government surplus will again be dwindling sources of scrap in 1949, while auto wreckers will probably produce more.

Assuming that the price of scrap continues an incentive to collectors, that the Department of Commerce drive develops an extra 1 million tons, and there is no war, scrap requirements of steel mills and foundries should be reasonably satisfied in 1949.

SALVAGE: *Bob Chambers drove his cab to this Carnegie Illinois slag dump to pick up a fare one day. When he saw pieces of steep scrap in the slag he forgot about the fare and pondered on how he could get the scrap out. Finally he arrived at the idea of using a magnet crane.*

Industrial Briefs . . .

• Plating Method—An improved acid copper bath which makes possible plating speeds up to 0.001 in. in 10 to 15 min has been deevloped by Dayton Bright Copper Co., Dayton. This new method employs no cyanide or hot baths and, because it gives off no offensive fumes or odors, requires no ventilation.

• Rail Order—The New York Central System has announced that orders totaling about $6.5 million for approximately 100,000 net tons of steel rail were placed with Carnegie-Illinois Steel Co., Bethlehem Steel Corp. and Algoma Steel Co. in Canada.

• Acquisition—Fort Duquesne Steel Co., Pittsburgh, has purchased majority stock control of the Hamilton Steel Co., Cleveland. Harry K. Hamilton will continue as president of the Hamilton company and Donald C. Lott, president of Fort Duquesne, has been elected chairman of the board of directors. E. W. Harwell, until recently assistant manager of warehouses of Jones & Laughlin Steel Corp., has been elected vice-president and general manager.

• Change of Address—Rockwell Mfg. Co. has announced that its Pittsburgh Equitable Meter and Nordstrom Valve Divisions will be located at 25 Beale St., San Francisco, and 1102 Delano St., Houston.

• New York Agent—L. G. Rose of 30 Church St., New York, has been appointed agent by Boneham & Turner Ltd., Mansfield, England, for their jig grinder heads.

• Elects Officers—The Capitol District of the Institute of Scrap Iron & Steel has elected Philip Sher of the Hudson Scrap Iron & Metal Co., Albany, as president. Leonard Klein, Joseph Klein Co., Albany, was named vice-president and Herman Garbowitz, Samuel Garbowitz Co., Schenectady, was elected treasurer.

• Enters New Field—Texas Engineering & Mfg. Co., Dallas, has entered the electronics field with substantial contracts to produce automatic code flashers designed by W. R. Lightbody, Inc. of New York.

• Name Change — Rigidized Metals Corp. is the new name which has been adopted by the former Rigid-Tex Corp., Buffalo, producers of design-strengthened and textured stainless steel, aluminum and other ferrous and nonferrous metals.

• To Receive Medal—Malcolm Pirnie of Malcolm Pirnie Engineers, New York, has been named 1948 winner of the Hoover Medal, jointly awarded by four national engineering societies. The award is in special recognition of Mr. Pirnie's leadership in the formulation of a program sponsored by the Engineers Joint Council, for the postwar industrial control of Germany and Japan.

• Expanding—Wilson & Geo. Meyer & Co., Pacific Coast distributors of agricultural and industrial chemicals, is constructing a $150,000 warehouse and office building in Los Angeles. Among the products which will be warehoused are copper, magnesium, manganese and zinc compounds.

• Southern Outlet—Wheelco Instruments Co., Chicago, has announced the opening of a new district office at 2204 Fannin St., Houston, under the direction of George Hatfield.

• Changes Name — Effective Jan. 1, the Southern Steel Works Co., Birmingham, will change its name to O'Neal Steel Works Co. The warehouse affiliate, Southern Steel Co., will become O'Neal Steel Co.

Deere & Co. Negotiating For Crucible Furnaces

New York

• • • **Crucible Steel Co.** of America people confirmed last week that negotiations are underway for sale of melting facilities at the company's Park Works, Pittsburgh, to Deere & Co., of Moline, Ill. The negotiations do not concern any of Crucible's finishing facilities and will have no effect on other divisions of the company.

The facilities involved include 4 openhearth furnaces of 50-ton capacity and 2 arc-electric furnaces of 10-ton capacity. Total annual capacity of these facilities is rated at about 175,000 tons. They were built during World War I.

The company emphasized that the Park works is essentially a finishing plant and that none of these facilities are involved. As presently envisioned Crucible would continue to operate the melt shop for Deere & Co. Crucible would receive a share of the ingots. But the major portion of the output would go to the Deere Co.

Deere & Co. manufactures farm equipment and machinery. Trade circles interpret the negotiations to buy steelmaking facilities as a move on the company's part to assure itself a supply of steel. Ingots from the Park works would need to be converted into finished steel.

The contract between the two companies is expected to be signed this week.

Deere & Co. has been in the conversion market for some time. Inland Steel in Chicago has been doing much of their conversion, practically all of which has been bars or sections. Up until now a large share of their ingots have been coming in from the West Coast. It appears their Crucible purchase would enable them to get their ingots somewhat cheaper in spite of the freight from Pittsburgh.

Southern States Dividend

• • • **Southern States Iron Roofing Co.** has announced a fourth-quarter dividend of 31¼¢ per share on preferred stock and 25¢ per share on common stock payable January 2nd to stockholders on record December 20, 1948.

French Will Purchase $50 Million Steel Mill If U. S. Gives Approval

Pittsburgh

• • • **A combine of eight** French companies wants to purchase a $50 million complete 66-in. cold strip steel mill in this country. This is in addition to the $27 million 66-in. continuous hot strip mill now being shipped by United Engineering Co. for the two-company combine at Denain. (THE IRON AGE, Nov 14, 1946, p. 116.)

This was disclosed here by Albert B. McCloskey, Westinghouse Electric International Co., and G. E. Stoltz, Westinghouse Electric Corp., who recently returned from a 5-week tour of France, Belgium and Switzerland. They said that the equipment outlined by the new French combine, Sollac, included a 46-in. blooming mill, a 66-in. hot strip mill, a 66-in. three-stand cold sheet mill and a 48-in. five-stand cold strip tinplate mill with electrolytic tinning lines and auxiliary equipment. Units would be built at Hayange and Ebange in northeastern France.

Approximately 30 pct of the money needed for this equipment has been raised by stock and bond issues in France. If all goes well the balance will be supplied by the French Government out of ECA funds.

There has been no indication to date as to who will get the order for the mill if the deal is approved. Westinghouse, it was indicated, would get the electrical equipment order. The tinplate mill will probably be a duplicate of that of Jones & Laughlin at Aliquippa if Mesta gets the order. If United gets it the Weirton type tinmill will probably be furnished.

•

Ore Shipments Increase

Stockholm

• • • **Sweden's iron ore** shipments during the first 10 months of 1948 amounted to 9,851,000 tons, an increase of 40 pct compared with the same period last year, when the quantity exported was 6,902,000 tons.

More than half of the shipments went to Great Britain, Belgium and Luxembourg. The balance was divided among the United States, bizonal Germany, Czechoslovakia, Poland, the Netherlands, Finland, Norway, and Austria.

Swedish exports of iron and steel totaled 103,000 tons, a slight increase over last year. Imports of pig iron went down from 115,000 to 84,000 tons, while imports of structural steel were practically unchanged at about 560,000 tons.

•

Plans New Steel Mill

Belgrade

• • • **Yugoslavian iron** and steel industry is going to be run by British experts, according to the Mackenzie Engineering Co., which is here to study and advise on the country's 5-year plan.

The Minister of Heavy Engineering says the agreement is a part of a series of trade pacts which are under negotiation between the two countries.

British businessmen in Yugoslavia recently reported that they have already signed contracts for rolling mill machinery.

•

French Imports Increase

Paris

• • • **Excess of French** imports over exports increased further during October. Imports valued at 72.2 billion francs were up 10 pct, while exports set at 44 billion showed an increase of 4 pct.

The upward pressure on domestic prices resulting from the recent devaluation of the franc was increased last month by a reduction of subsidy payments in the program to stabilize the cost of many basic commodities.

An increase of 18.5 pct in the price of coal was followed shortly by respective advances of 25 and 19 pct in gas and electricity.

Volta Redonda Grows

Volta Redonda, Brazil

• • • **Steel production** at the Volta Redonda plant is expected to exceed 200,000 tons this year as compared with 146,000 tons for 1947. As a result of this increase in output, the State of Rio de Janeiro now accounts for 60 pct of Brazil's entire output of steel, while the respective figures for the States of Minas Geraes and Sao Paulo have fallen off to 20 and 15 pct, respectively.

Although Brazil is badly in need of railroads which she could use to good advantage for developing an extensive ore export trade, rails are a major factor in her current export trade. She is hard pressed for money. So during the first half of this year rails valued at $3.3 million were exported.

•

Russian Output Rises

Stalingrad

• • • **Russian steel** production is going to hit a new peacetime peak this year with 22,220,000 net tons of ingots. This is more than 5 million tons over last year's output.

Officials point to (1) adequate stockpiles of raw materials at the mills during bad weather and a comparatively mild winter, (2) more efficient productivity of labor, and (3) operation of new, modernized and rebuilt facilities.

The Soviet goal for 1950 is set for about 27.5 million net tons. Many plants, particularly the Magnitogorsk plant, have already reached their 1950 goal, while the Red October plant here attained prewar production during August.

Coming Events

1949

Jan. 10-14 **Society of Automotive Engineers,** annual meeting, Detroit.
Jan. 10-14 **Material Handling Institute and American Society of Mechanical Engineers,** Materials Handling Show, Philadelphia.
Jan. 14 **Malleable Founders' Society,** semiannual meeting, Cleveland.
Jan. 24-25 **Industrial Furnace Manufacturers Assn.,** mid-winter meeting, Cleveland.
Jan. 24-28 **American Society of Heating & Ventilating Engineers,** annual meeting, Chicago.
Feb. 9-10 **Steel Founders Society of America,** annual meeting, Chicago.
Feb. 14-17 **American Institute of Mining & Metallurgical Engineers,** annual meeting, San Francisco.
Feb. 28-Mar. 4 **American Society for Testing Materials,** spring meeting, Chicago.
Mar. 8-10 **Society of Automotive Engineers,** passenger car, body and production meeting, Detroit.

AMERICAN IRON AND STEEL INSTITUTE

Production of Open Hearth, Bessemer and Electric Steel Ingots and Steel for Castings

YEAR 1948

(Preliminary)

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production (Net tons)	Number of weeks in month
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
January	6,768,497	95.5	343,169	77.5	361,110	79.0	7,472,776	93.6	1,686,857	4.43
February	6,245,338	94.3	340,596	82.3	354,270	82.9	6,940,204	93.0	1,676,378	4.14
March	6,841,578	96.6	363,235	82.0	403,322	88.2	7,608,135	95.3	1,717,412	4.43
1st Quarter	*19,855,413*	*95.5*	*1,047,000*	*80.6*	*1,118,702*	*83.4*	*22,021,115*	*94.0*	*1,693,932*	*13.00*
April	5,640,168	82.2	185,089	43.2	392,900	88.7	6,218,157	80.4	1,449,454	4.29
May	6,799,289	96.0	355,562	80.3	416,801	91.1	7,571,652	94.8	1,709,177	4.43
June	6,481,879	94.5	356,810	83.2	417,665	94.3	7,256,354	93.8	1,691,458	4.29
2nd Quarter	*18,921,336*	*90.9*	*897,461*	*69.0*	*1,227,366*	*91.4*	*21,046,163*	*89.7*	*1,617,691*	*13.01*
1st 6 months	*38,776,749*	*93.2*	*1,944,461*	*74.8*	*2,346,068*	*87.4*	*43,067,278*	*91.9*	*1,655,797*	*26.01*
July	6,346,423	89.8	324,991	73.6	395,610	86.7	7,067,024	88.7	1,598,874	4.42
August	6,631,157	93.6	371,205	83.8	435,246	95.2	7,437,608	93.1	1,678,918	4.43
September	6,592,226	96.3	387,153	90.5	436,231	98.7	7,415,610	96.1	1,732,619	4.28
3rd Quarter	*19,569,806*	*93.2*	*1,083,349*	*82.5*	*1,267,087*	*93.5*	*21,920,242*	*92.6*	*1,669,478*	*13.13*
9 months	*58,346,555*	*93.2*	*3,027,810*	*77.4*	*3,613,155*	*89.4*	*64,987,520*	*92.1*	*1,660,386*	*39.14*
* October	7,118,299	100.5	409,545	92.5	459,268	100.4	7,987,112	100.0	1,802,960	4.43
† November	6,910,184	100.7	411,049	95.9	441,983	99.8	7,763,216	100.4	1,809,607	4.29
December										4.42
4th Quarter										*13.14*
2nd 6 months										*26.27*
Total										*52.28*

Note—The percentages of capacity operated are calculated on weekly capacities of 1,599,286 net tons open hearth, 99,962 net tons Bessemer and 103,228 net tons electric ingots and steel for castings, total 1,802,476 net tons; based on annual capacities as of January 1, 1948 as follows: Open hearth 83,610,690 net tons, Bessemer 5,226,000 net tons, Electric 5,396,770 net tons, total 94,233,460 net tons.

* Revised.

† Preliminary figures, subject to revision.

YEAR 1947

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production (Net tons)	Number of weeks in month
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
January	6,550,058	95.2	384,096	87.7	288,458	66.9	7,222,612	93.2	1,630,386	4.43
February	5,835,018	93.9	314,912	79.6	280,471	72.0	6,430,401	91.9	1,607,600	4.00
March	6,619,641	96.2	378,893	86.5	318,440	73.8	7,316,974	94.4	1,651,687	4.43
1st Quarter	*19,004,717*	*95.1*	*1,077,901*	*84.8*	*887,369*	*70.9*	*20,969,987*	*93.2*	*1,630,637*	*12.86*
April	6,365,670	95.5	375,675	88.6	310,497	74.3	7,051,842	93.9	1,643,786	4.29
May	6,640,004	96.5	372,878	85.2	326,132	75.6	7,339,014	94.7	1,656,662	4.43
June	6,317,705	94.8	351,247	82.8	308,762	73.9	6,977,714	92.9	1,626,507	4.29
2nd Quarter	*19,323,379*	*95.6*	*1,099,800*	*85.5*	*945,391*	*74.6*	*21,368,570*	*93.9*	*1,642,473*	*13.01*
1st 6 Months	*38,328,096*	*95.4*	*2,177,701*	*85.2*	*1,832,760*	*72.8*	*42,338,557*	*93.5*	*1,636,589*	*25.87*
July	6,033,512	87.9	256,125	58.6	289,048	67.2	6,578,685	85.1	1,488,390	4.42
August	6,329,497	92.0	346,033	79.0	315,622	73.2	6,991,152	90.2	1,578,138	4.43
September	6,152,348	92.5	334,425	79.0	310,684	74.6	6,797,457	90.8	1,588,191	4.28
3rd Quarter	*18,515,357*	*90.8*	*936,583*	*72.2*	*915,354*	*71.6*	*20,367,294*	*88.6*	*1,551,203*	*13.13*
9 Months	*56,843,453*	*93.8*	*3,114,284*	*80.8*	*2,748,114*	*72.4*	*62,705,851*	*91.9*	*1,607,842*	*39.00*
October	6,831,984	99.3	384,272	87.8	353,896	82.1	7,570,152	97.7	1,708,838	4.43
November	6,543,390	98.2	360,620	85.0	338,417	81.0	7,242,427	96.5	1,688,211	4.29
December	6,654,966	96.9	373,367	85.5	347,308	80.7	7,375,641	95.4	1,668,697	4.42
4th Quarter	*20,030,340*	*98.1*	*1,118,259*	*86.1*	*1,039,621*	*81.3*	*22,188,220*	*96.5*	*1,688,601*	*13.14*
2nd 6 months	*38,545,697*	*94.4*	*2,054,842*	*79.1*	*1,954,975*	*76.4*	*42,555,514*	*92.6*	*1,619,928*	*26.27*
Total	76,873,793	94.9	4,232,543	82.1	3,787,735	74.6	84,894,071	93.0	1,628,195	52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,553,721 net tons open hearth, 98,849 net tons Bessemer and 97,358 net tons electric ingots and steel for castings, total 1,749,928 net tons; based on annual capacities as of January 1, 1947 as follows: Open hearth 81,010,990 net tons, Bessemer 5,154,000 net tons, Electric 5,076,240 net tons, total 91,241,230 net tons.

Symposium Helps Correlate Titanium Research and Development

About 200 Attend Meeting Sponsored by Office Of Naval Research

° ° °

By E. S. KOPECKI
Metallurgical Editor

° ° °

Washington

• • • **Representing** the first concerted endeavor in correlating the efforts of the many researchers engaged in the research on and development of titanium and titanium-base alloys, a symposium was held at the National Academy of Sciences, Dec. 16. Sponsored by the Office of Naval Research, the symposium attracted some 200 technical people, representatives of government agencies, educational institutions and industrial laboratories.

Titanium—or the "Cinderella of metals" as it has been referred to in the popular press—does possess attractive properties even in its unalloyed condition, particularly with regard to its lightness, strength, corrosion resistance and ductility. Its high strength-weight ratio makes it attractive for aircraft construction as a substitute for aluminum, magnesium and steel. The possibility of titanium alloys serving the high temperature field is also under study, and the interest in this phase was certainly indicated by the presence of some well-known "high temperature metallurgists" at the symposium.

Various phases of the subject were explored, embracing reports on research and development programs now underway, production and properties of titanium, alloys of titanium, and physical metallurgy of titanium and its alloys. The symposium was particularly appropriate at this time, in that it did result in the dissemination of much valuable technical data, but more importantly, it focused attention on the fact that the overall program is sufficiently advanced to warrant clarification of processing methods and testing procedures. Physical properties do vary, sometimes quite considerably, depending upon the procedure employed in the making of the metal, since the various methods reported do produce metallic titanium containing different types and amounts of impurities.

All this was brought out at the meeting, interestingly enough, not by the speakers in their formal presentations, but rather in the spirited discussions that followed. As the symposium progressed, it became apparent that physical property data—concerning endurance limit principally was being reported by various investigators to extend over a considerable range of values. It appears that when additional physical property data are revealed it will be necessary to associate the values with a particular method of metal production.

Although the metal production aspect came in for its share of attention, the overall interest did lie, necessarily, in the melting and alloying phases. Melting techniques are especially important, inasmuch as titanium is highly reactive and combines very readily with many gaseous and metallic elements. Methods of overcoming these difficulties were discussed by J. B. Sutton, E. I. duPont de Nemours & Co., in his paper entitled "Induction Melting of Titanium Metal in Graphite"; L. W. Eastwood of Battelle Memorial Institute discussed the "Production and Arc-Melting of Titanium"; while E. J. Chapin of the Naval Research Laboratory presented a "Description of Apparatus for the Melting of Titanium and for the Study of the Titanium-Oxygen System."

Physical properties of the commercially pure and refined types of titanium were revealed by C. I. Bradford, Remington Arms Co., B. W. Gonser, Battelle Memorial Institute, and F. B. Litton, Foote Mineral Co. Properties of the metal and its alloys are extremely interesting, and some of the significant results divulged at the symposium will be presented in a subsequent issue of THE IRON AGE.

The alloying phase, which will certainly constitute a long-range program, was introduced by E. I. Larsen, P. R. Mallory & Co., Inc.; H. C. Cross, Battelle Memorial Institute; and P. H. Brace of Westinghouse Research Laboratories.

For those interested in the detailed proceedings of this session,

Bend Radius <1
Inert Arc and Seam Welded
by GENERAL ELECTRIC
Turned Rod
Forged

UTILITY: *These exhibits of the Remington Arms Co., Inc., show titanium from the research program. The metal can be formed, spot, inert arc and seam welded, turned and forged.*

the Office of Naval Research, Navy Dept., Washington 25, announces that a limited supply of pamphlets, including copies of the 17 papers presented, will be available on request.

•

AIME Talks Titanium, Too

New York

• • • **Any extensive** use of titanium metal, superimposed on top of present uses for titanium dioxide, will require a reappraisal of present titanium ore sources, F. R. Milliken, manager, National Lead Co., Titanium Div., MacIntyre Development, Tahawus, N. Y., told members of the New York Section, AIME, at a meeting held Dec. 16.

Mr. Milliken, in reviewing the development of the titanium industry, cited as two of the more important new sources of ore the New Jersey Zinc-Kennecott Copper Allard lake deposit and Du Pont's new development in Florida. The Russians, he said, had also reported new titanium ore deposits, but these have not been confirmed.

Roy Dahlstrom, technical director, National Lead Co., Titanium Div., another speaker at the meeting, decried the term "Cinderella of Metals," being applied to titanium metal. He stressed that the successful industrial use of titanium metal will require extensive application of engineering skill.

A report from O. C. Ralston, chief, metallurgical branch, Bureau of Mines, read at the meeting, pointed out that titanium metal and stainless can be competitive in many fields, and supplementary in many others.

Birmingham Plant Closes

Birmingham

• • • **Rheem Manufacturing** Co. is closing its Birmingham plant and production here will be absorbed by other plants of the company.

A company statement said that increased freight rates on products produced at the Birmingham plant and shipped to different areas of the United States and steel shortages were important factors influencing the decision. Warehouse facilities will be maintained here.

The Birmingham plant has been in operation since 1942 and employed approximately 2000 workers at the peak of employment.

○ ○ ○

JET TRAIN MODEL: *Lorraine Santopadre holds a model of a jet propelled locomotive capable of speeds up to 250 mph which was originated by George Lanwerneger, 19, of Waukegan, Ill. It was shown recently at the American Inventors Exhibit, a permanent show place for inventions in Chicago.*

○ ○ ○

Export Tinplate Raised

New York

• • • **U. S. Steel Export Co.,** U. S. Steel Subsidiary, announced the following new export base prices covering tin mill products with freight included to New York, Philadelphia or Baltimore.

These prices apply on carload lots and will become effective with shipments made on and after 12.01 a. m. Jan. 1, 1949.

All sales are subjected to seller's price in effect at time of shipment. All prices are net cash.

TIN PLATE 107#	PER BASE BOX
American Coke, 1.25 lb........	$8.85
American Coke, 1.50 lb.	9.10
Ferrostan—unassorted, 0.25 lb	7.80
Ferrostan—unassorted, 0.50 lb.	8.05
Ferrostan—unassorted, 0.75 lb.	8.35
Special coated manufacturing ternes—unassorted	8.00
Manufacturing ternes — unassorted	8.55

Promises No Price Change

Hamilton, Ohio

• • • **Hamilton Foundry & Machine** Co. has announced in a letter to customers that casting prices established Oct. 1, 1948, and now in effect, will be generally continued for shipments through March 31, 1949. Until that date, the company's letter stated, prices on jobs on which there are no current quotations will be completed on the October, 1948, basis.

Alan Wood Dividend

Philadelphia

• • • **The board** of directors of Alan Wood Steel Co. has declared a regular quarterly dividend of $1.25 per share on the outstanding 5 pct cumulative preferred stock and a quarterly dividend of 25 cents per share on the outstanding common stock. Both dividends are payable Jan. 1, 1949 to stockholders of record Dec. 10, 1948.

M. A. Hanna Co. Dividend

Cleveland

• • • **Directors** of M. A. Hanna Co. have declared a dividend of $3.00 a share on common stock, payable Dec. 13 to stockholders of record at the close of business Dec. 3. The dividend makes a total of $5.00 a share in 1948, comparing with a total of $3.20 a share paid last year.

Paul Hoffman Orders Investigation Of Aluminum Flow from Britain to U. S.

Washington

• • • **The Economic** Cooperation Administration moved this week to prove that Marshall Plan countries can't have their cake and eat it too.

A full investigation into charges of resale by some Western European nations of aluminum and other scarce metals to the United States has been ordered by ECA Administrator Paul Hoffman and Deputy Administrator Howard Bruce.

After considerable prodding by U. S. metal customers (THE IRON AGE, Nov. 25, p. 137), ECA has concluded that Britain and other recipients of economic aid must decide between eating the cake and keeping it. Aluminum customers in particular complain that they are paying Britain three times for imported metal—in tax money for ECA appropriations, in shipping charges, and in over-the-market prices.

The investigation being conducted this week is focused primarily on British import figures and U. S. import records. In Britain, where exports are licensed as in the U. S., officials say no aluminum scrap has been licensed for export since 1946. In the U. S. the Commerce Dept. says that 34,600,000 lb plus were imported from Britain in the first 10 months of this year.

Mr. Bruce's attitude is this: If our investigation discloses that we are okaying purchase by the Western European countries of more materials than they need, we'll reduce their authorizations. If not, it stands as it is.

Thomas Finletter, ECA chief for Britain, offers two possible explanations for the difference between British export and American import figures.

For one thing, he states, exports from other nations which passed through the United Kingdom on their way to the U. S. may have been incorrectly marked as originating in the UK.

Another explanation, he adds, is that traders in fabricated aluminum imported such aluminum, if in poor condition, into the U. S. as scrap because of the prevailing high price here. But he states that no shipments of aluminum scrap could leave Britain without the knowledge of the British government "in view of the export control system now in force in Britain."

Early last week, Bruce stated that he would cut future ECA allocations of metals if export practices were not explained or brought under complete control by recipient countries. He named Britain, Belgium and The Netherlands as the offenders.

Later in the week he altered this stand and said he "had no proof" that the same metals paid for by ECA were resold here as scrap. But ECA is going to "look for the facts" he said and added that "if this return flow is caused by our sending too much scarce material we'll do something about it."

Seeks Gear Capacity Data

Pittsburgh

• • • **Two questionnaires** have been distributed by the American Gear Manufacturers Assn. for the purpose of getting data on the gearing industry which will help the National Security Resources Board in its study of American industry.

When this data is tabulated it will show the noncaptive gear cutting capacity of this country for the first time. Since gears are an important component in both our domestic and defense programs, this information will be extremely helpful to NSRB.

Although over 700 forms have been sent out, the association feels that it does not have a complete listing of all gear manufacturers in the United States. Any gear manufacturer who has not received such a form is requested to write for one to Newbold C. Goin, Executive Secretary, AGMA, Empire Building, Pittsburgh 22, Pa.

NEW LOOK: *The new aluminum foil laminate fire fighting suit, shown left, is rapidly replacing the bunkin suit, center, which has been used for many years by the Air Forces. The new style was created at the Air Materiel Command's Aero Medical Laboratory at Wright-Patterson Air Force Base, Dayton, Ohio.*

Engineers Predict New Continuous Coal Miner Will Revamp Industry

Pittsburgh

• • • It won't come overnight but a revolution in coal mining is on its way. This is the opinion of coal operators and independent engineers who saw the first public showing of a continuous miner near here last week. Joy Mfg. Co., developers and builders of the new machine, staged the demonstration at Mathies Mine, near Finleyville, Pa. Mathies is a Pittsburgh seam mine of Pittsburgh Coal Co., subsidiary of Pittsburgh Consolidation Coal Co., world's largest commercial coal company.

The business-end of the new Joy machine consists of a head, or ripper bar fitted with six chains each containing 20 tungsten carbide bits. This head, which can swing 45 deg from center in either direction, is advanced by hydraulic rams into the seam at the floor and then moved up to the roof.

The coal ripped from the seam by the head is carried over the back of the machine on a conveyor that loads it into an electrically operated shuttle car. The shuttle car moves back on rubber tires to transfer the coal. When mines are revamped to use the continuous miner the shuttle car will unload onto a conveyor that will feed coal cars outside the mine entry.

Greater safety and more efficiency are claimed for the new process, a claim operators and engineers present at the demonstration verified. Dust, is said to be less than that in any other type of coal mining, because of the nature of the cutting, better ventilation due to the smaller area being worked and high pressure water sprays built into the cutting head.

The continuous miner replaces a step-by-step mining sequence at the coal face with one complete operation. Current practice in most mines is to cut, drill, blast and load. These operations are performed by machines that must be moved in and out of each mining room in sequence. The new process is expected to salvage some of the time now lost and reduce the number of miners needed per ton of output. Continuous miners are not new in principle but until recently none have proved efficient.

As far as is known, the only other continuous miner recently produced is the "Colmol," a development of Sunnyhill Coal Co. This machine was demonstrated for the press on Oct. 28 of this year. It uses a series of rotary chipping heads that are advanced into the coal-seam as the machine moves forward.

J. D. A. Morrow, president of Joy Mfg. Co., said that the company has orders for more than 300 of the new units, which cost almost $50,000 each. He expects to be able to ship 150 machines by Sept. 30, 1949 and to boost output to 50 a month after that.

GM's Teletype System Keeps Central Office In Touch with Branches

Detroit

• • • **A new and completely** modernized private wire teletype system enables General Motors' central office to keep in constant touch with its plants located in 46 cities throughout the United States and Canada.

The new GM network is a two-way system, permitting stations to send and receive simultaneously. All messages are routed through the central office at Detroit. A perforated paper tape creates electrical impulses which spell out the message. The present system can handle approximately 1,360,000 words daily.

Coordination of the productive effort of its various plants, offices and warehouses has become a difficult problem for General Motors since production was resumed after the war. Efforts to obtain adequate material and steel supplies during a period of critical shortages alone has required the development of a communications system with greater speed and flexibility than any previous installation, it is reported.

At the present time three main units of equipment are employed in the automatic switching center in the central office in Detroit. One station receives from 14 incoming lines; another sends on as many outgoing lines. A third switching center is a mechanical "traffic director." The latter "scans" the addresses of messages and sends them to their proper destination. This setup also indicates whether traffic is light or heavy on the various circuits.

When the circuits are open, the perforated tape goes directly through the machines. When traffic is heavy, the tape becomes slack and loops downward. Thus, the size of the loop, if any, indicates traffic conditions on each circuit. When circumstances require additional equipment, it is cut into service.

Under the present GM system, a message from Chevrolet-Baltimore to New Departure-Bristol, Conn., is flashed to Bristol by way of Detroit. The transmission time between all points on the network is about two seconds when intermediate circuits are clear.

Continued Construction Boom May Need 8.5 Million Tons Steel

Physical Volume To Remain At Present Level But Dollar Value Up

◦ ◦ ◦

Washington

• • • **The present** construction boom may be expected to continue throughout all of 1949 according to the first official estimates by government agencies. Physically, the volume is expected to remain at present levels; dollar-wise, it is expected to exceed that of 1948.

Should this forecast hold good, steel requirements for construction materials of all kinds may run as high as 8,500,000 tons.

Last year's needs were originally estimated at 7 million tons. That was when construction volume was expected to amount to no more than $15 billion. But an upsurge shot the 1948 figure to a probable $18 billion which called for 15 pct more steel and other materials.

Initial estimates prepared jointly by the Labor and Commerce Depts. have forecast the 1949 construction volume at $18.7 billion. This is a 4 pct increase over 1948, some of which would be accounted for in higher costs.

The actual physical volume expected to be put in place next year is not figured to be appreciably greater than 1948. This estimate could be thrown out of balance should Congress enact legislation during the coming term which would return the government to the housing picture.

In this event, actual construction might be increased without much increase in total expenditure since publicly financed housing would be largely in the low-cost field. Regardless of additional legislation, the government is planning to increase public housing construction from 15,000 units in 1948 to at least 30,000 in 1949. It is likewise giving closer attention to steel prefabs.

The preliminary governmental construction estimates are based upon expectation of continued high employment and the assumption that building costs will not increase during the 12 months by more than 5 pct.

It is also assumed in the forecast that steel and other building materials production will be adequate to meet the demand. Admittedly, a shift in the distribution pattern could throw present estimates off balance.

Private financing will continue to account for major construction in the coming year—and at about the same level as 1948, approximately $13.3 billion. Publicly financed new construction is expected to increase by nearly a billion to a figure of $5 billion.

Privately financed residential construction will account for the largest single category of 1949 building activity as the statisticians now see it. The overall figure is tentatively placed at about $6.5 billion. However, a drop of from 30,000 to 50,000 from the 1948 figure of 875,000 units is expected.

The expected increase of 15,000 houses or apartment units financed by public funds will overcome part of the reduction. In addition, federal agencies concerned are confidently looking for some type of legislation which will put the government further into the housing picture. Some officials privately predict that should this happen, publicly financed units will more than take up the drop in privately financed units.

Aside from residential construction, most types of privately financed non-residential construction are expected to increase over 1948. The tentative overall figure is now in excess of $4 billion or 12 pct higher than the probable total for 1948.

Commercial construction such as stores, garages and so on is still on the uptrend and is expected to be about 15 pct greater than in 1948.

On the other hand, industrial types of construction such as factories and manufacturing plants were on the decline throughout most of 1948. This is expected to drop another 6 pct during the next 12 months to a final total of about $1.3 billion for 1949.

In addition to public housing, new public construction is expected to be increased next year by 24 pct or a billion dollars to reach a total of $5 billion. Nearly half of this amount will go into schools, hospitals and similar institutional work. Highway work will increase by 10 pct to $1.7 billion.

Farm construction is forecast as dropping from a total of $500 million in 1948 to about $450 million in 1949. On the other hand, unless pressure causes a break in the administration's ceiling for defense expenditure, military construction next year will increase by only about $25 million to a total of $175 million.

BUILDING HANGER: *A Chicago contractor has devised this large mobile sheet metal canopy that he moves over his building project during bad weather so that he can keep right on working from the time he starts in on a house until he finishes it.*

Form National Committee For Basing Point Fight

Pittsburgh

• • • **The first** indication of a nation-wide effort for the legislation of a delivered price system during the next session of Congress came with the announcement of the formation of the National Competition Committee in Pittsburgh recently.

The new committee had its beginning in Pittsburgh early in September when a group of industrialists who were concerned about the implications of the Supreme Court decision in the cement case, gathered to form the first local chapter. Since then chapters have been formed in Tulsa, Dallas, Houston, Cincinnati, Dayton, Cleveland, Pittsburgh and Philadelphia. The committee reports that other chapters are now forming in principal cities as rapidly as possible.

Members of the new committee have embarked on a campaign to enlist the strength of natural proponents for the legislation. They have also undertaken the responsibility for outlining to their own employees and Congressmen in their districts the difficulties which they are now facing, or will face, under a mandatory fob pricing system.

The new committee declares that it "in no way parallels the efforts of the associations and organizations which have gone on record as opposing an fob pricing system. It will remain in existence only as long as it takes to get clarification of the present price muddle. Its membership extends to every type of business which absorbs freight in an effort to compete nationally. Ninety pct of its membership could well be termed small business."

The program of the committee is financed by membership dues ranging from $100 to $1000 for each member.

The first national meeting was presided over by John P. Roche, vice president, Heppenstall Co.

Stewart-Warner Dividend

Chicago

• • • **Directors of** Stewart-Warner Corp. have declared two cash dividends on the $5 par value common stock. A dividend of 25 cents per share is payable on Jan. 8, 1949, to stockholders of record at the close of business Dec. 16, while an additional year-end dividend of 50 cents per share will be paid Dec. 24 to stockholders of record Dec. 6, James S. Knowlson, president and board chairman, revealed.

Dividends of 25 cents per share were paid Jan. 10, Apr. 10, July 10 and Oct. 9, 1948.

Armco Wins Safety Award

Middletown, Ohio

• • • **Armco Steel Corp.'s** fabricating division has compiled a record of more than a million work-hours without a major accident.

C. E. Stutenroth, assistant manager of the division, said that the men of the fabricating division had worked a total of 1,030,000 consecutive hours without an accident that caused any of the 700 men to lose work.

The 258 consecutive days of safety places the fabricating division in the lead in the National Safety Council's contest for heavy steel fabricators with a zero accident frequency rate (number of major accidents per million man hours).

The million - work - hours of safety earns for the Armco plant the distinguished service award of the National Safety Council, Mr. Stutenroth said.

Murray Asks Labor Unity

Washington

• • • **Philip Murray,** CIO president, last week issued a call for labor leaders to unite in support of "New Deal principles" and new labor legislation as outlined in the 1948 Democratic platform.

The proposal was contained in letters to leaders of the AFL and the Railway Brotherhoods. Proposing that committees be appointed from each group to meet as quickly as possible, Murray said the election was a mandate for discarding that "evil creature, the Taft-Hartley law."

At such a meeting, he said, the various unions could coordinate "our efforts in supporting a common program of legislative measures for the 81st Congress."

Joins Founders' Society

Cleveland

• • • **Gray Iron** Founders' Society recently admitted to membership the United States Radiator Corp., Detroit. The Detroit foundry specializes in furnace and stove castings. B. F. Emrick will represent his company on society matters.

As a member of the national organization, U. S. Radiator will automatically become a member of the local Detroit Management Group of the society, which will hold regular monthly meetings of gray iron foundry executives in the area for the purpose of discussing common, local problems.

Machine Tools a Problem

London

• • • **The British Assn.** of Used Machine Tool Merchants has asked the Minister of Supply to stop immediately the sale of the remaining stock of government-owned machine tools, according to E. J. F. Bradley, a member of the association.

In a full explanation of the situation to the Minister of Supply, the association stated that the decision to auction these machines was wrong. The only reply received from the Ministry was from the director of disposals, who stated that the views expressed would be given consideration.

Two factors have been bothering the association for some time: sale prices have been ridiculously low and many of the machines which are essential to defense are finding their way out of the country.

Sylvania Buys New Plant

Emporium, Pa.

• • • **Sylvania** Electric Products, Inc., has purchased the plant formerly occupied by the Rumsey Pump Co. at Seneca Falls, N. Y., according to J. C. Farley, general manager of the Radio Tube Div. The plant will turn out television tubes.

The new plant contains approximately 98,000 sq ft of space. After completion it is estimated that it will provide employment for 350 to 400 persons. Acquisition of the plant is consistent with Sylvania's policy of industrial decentralization now operating in 25 plants located in 5 states.

Canadian Output Rebounds

Toronto

• • • **Production of steel** ingots and castings in Canada for October totaled 281,866 net tons, which was an average daily rate of 87.5 pct of total rated capacity.

This compares with 257,865 tons for September, when the average was 82.7 pct, and with 256,461 tons in October of last year when the rate was 85.1 pct of a smaller rated capacity.

Following are comparative monthly production figures for steel ingots and castings for 1948 in net tons:

MONTH	STEEL INGOTS	STEEL CASTINGS
January	247,768	8,958
February	230,183	9,463
March	275,349	10,677
April	254,315	9,951
May	279,688	9,879
June	249,710	9,655
July	238,104	6,768
August	254,362	8,692
September	248,622	9,243
October	272,127	9,739
Total, 10 months	2,550,228	93,025

Following are comparative monthly production figures for pig iron and ferro-alloys for 1948 in net tons:

MONTH	PIG IRON	FERRO-ALLOYS
January	160,042	17,127
February	151,123	11,823
March	172,675	14,293
April	170,785	14,474
May	193,305	18,436
June	183,763	13,502
July	187,940	12,939
August	191,383	12,700
September	182,465	12,318
October	186,424	19,489
Total, 10 months	1,779,905	147.099

Coal Production Lags

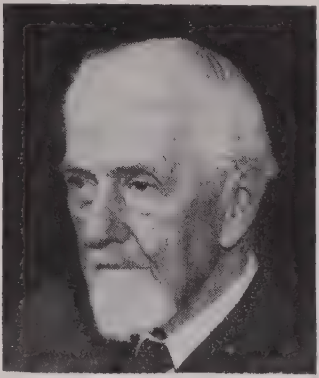
Pittsburgh

• • • **Some 2500 or 10 pct** of the coal miners in District 5 have been idle for 8 weeks due to overproduction in the strip and truck mines, according to John P. Bursarello, district president. They are principally in Washington and Allegheny counties of this area.

Recently the Baltimore & Ohio R. R. announced some layoffs due to a softening of business. This looks bad until some facts are stacked against these: (1) metallurgical coal miners, supplying the mills, are all working, (2) coal companies have long known that use of other fuels was cutting into their market and they are spending a fortune to find other uses for coal, and (3) the B&O derives about half of its revenue from coal handling.

A Man and His Dreams

Coatesville, Pa.



Charles L. Huston

• • • **A unique record** in the annals of the American Steel industry were marked here recently when Charles Lukens Huston began his 74th year of continuous service with Lukens Steel Co.

Mr. Huston, grandson of Dr. Charles and Rebecca Lukens, for whom the company is named, now in his 93rd year, started with the concern on Dec. 15, 1875, as a clerk and bookkeeper in its offices. Today, as first vice president, he is still spry of foot and keen of interest, and he walks to his office daily from his nearby home.

Actually, Mr. Huston's association with the steel company reaches 78 years, for in his teens he wheeled coal and helped with other mill chores—and without pay—while he was on summer vacations from school.

Mr. Huston received $8 a week for his first clerical and bookkeeping job, and "I saved money at that," he remembers smilingly. Despite his literary studies at Haverford College, of which he is the oldest living alumnus, his bent was always toward mechanical things. When opportunity came, therefore, to go into Lukens puddling mill under the guidance of his father's partner, Charles Penrose, he said today, "I did not let it pass me by. I didn't know too much about the puddling of iron to make it malleable by expelling carbon, but I asked my fellow workmen to help me, and they did, and we got on famously well."

Mr. Huston played an important part in this development. He is the patentee of several highly regarded inventions used in the manufacture of steel and he planned and designed Lukens four-high 206-in. mill, world's largest plate mill, and was largely responsible for the installation of the first head-spinning machine at Lukens, during the years (1882-1925) when he was in charge of plant operations. He was elected vice-president of Lukens in 1897, and from 1917 to 1925, he was vice president and works manager. In 1925, he relinquished the position of works manager but continued as first vice-president, a position in which he still serves.

Lukens' 206-in. Mill

Construction Steel . . .

• • • **Fabricated steel awards** this week included the following:

500 **Tons,** Bath, Me., crane runway for Bath Iron Works, through Morton C. Tuttle Co., to Berlin Construction Co., Berlin, Conn.

320 **Tons,** Sterling, Ill., State highway bridge section 18F, to Clinton Bridge Works, Clinton, Iowa.

160 **Tons,** Brooklyn, N. Y.-Kingsway Jewish Center, Kings Highway and Nostrand Ave., to Grand Iron Works, New York.

130 **Tons,** Castor, Wyo., Cortez Dams, U. S. Bureau of Reclamation Specification 2472, to American Bridge Co., Pittsburgh.

120 **Tons,** Newton, Mass., Stowe-Woodward Inc., addition, through J. J. Hawkins Co., Newton, to West End Iron Works, Cambridge, Mass.

110 **Tons.** Mooseheart, Ill., Church building, to Wendnagle & Co.

100 **Tons,** Maine, bridges, to Phoenix Bridge Co., Phoenixville, Pa.

100 **Tons,** Maine, Scituate, Mass., grade school, through R. J. Jaccobbucci, Quincy, Mass., to West End Iron Works, Cambridge, Mass.

100 **Tons,** Pittsfield, Mass., crane runway for General Electric Co., to James McKinney & Sons, Albany, N. Y.

• • • **Fabricated steel inquiries** this week included the following:

2200 **Tons,** Hastings, Minn., State Highway bridge over Mississippi River, Clinton Bridge Co. Low bidder.

400 **Tons,** Beloit, Wis., high school building; previously reported; has now been abandoned.

335 **Tons,** Detroit, Ore., construction of Detroit Dam, Portland District, Corps Engineers, Portland, Serial Eng—35-026-49-333. Bids to Feb. 25 (tentative date).

• • • **Reinforcing bar awards** this week included the following:

1500 **Tons,** Los Angeles, bridges on Belhart St. over Los Angeles River, through Guy F. Atkinson Co., to Blue Diamond Corp., Los Angeles.

225 **Tons,** Wausau, Wis., Marathon Building, through Permanent Construction, to Worden Allen Co., Milwaukee.

• • • **Reinforcing bar inquiries** this week included the following:

2130 **Tons,** Detroit, Ore., construction of Detroit Dam, Portland District, Corps Engineers, Portland, Serial Eng—35-026-49-333. Bids to Feb. 25 (tentative date).

110 **Tons,** Long Beach, Calif., incinerator on Pier A, Long Beach Board of Harbor Commissioners, Spec. H.D. 264. Bids to Jan. 14.

105 **Tons,** Wheeling, Ill., convent building; previously reported; has now been abandoned.

• • • **Tunnel liner awards** this week included the following:

2680 **Tons,** Riverside Junction, N. D., Tunnel liners through Garrison District, U. S. Engineers, to Commercial Shearing & Stamping Co., Youngstown, Ohio.

50 YEARS AGO

THE IRON AGE, *December 22, 1898*

• Major tinplate producers got together in Chicago last week, tossed all their chips in one pot and labeled it the American Tinplate Co. This is the biggest combo to hit the iron and steel industry to date. Other large capital mergers have enough competition from important independents to prevent absolute control of prices by one company. But, the real power of the new company is not yet fully appreciated in the trade.

• Sam Gompers is still in the saddle. His fight for labor during the last quarter century has again been rewarded with his re-election as president of the American Federation of Labor at its annual convention in Kansas City last week. Sam started the AF of L back in 1865 and has nurtured it all these years.

• A monster multiple drill has invaded the steel industry. The Bausch & Harris Machine Tool Co. has just finished this machine for drilling eight 1½ in. holes in cast iron with an adjuster head which can be easily operated by one man. A second drill of the same size is in the works now.

• Big Mark Hanna, Senator from Ohio, has introduced a bill in the Senate to increase the stature of our merchant marine. The bill carries out generally the recommendations made by President McKinley in his annual communication to Congress. It also parallels legislation in France and Germany who are spending large sums of money annually for the development of their merchant marine.

• Iron ore shipments hit a new high this year as mines shipped almost 3 million tons. Even more is expected next year. Here's how the sources line up: Gogeboc range consisting of the Norrie groups at Ironwood, Mich., 832,348 gross tons; Tilden at Bessemer, 352,445; Vermillion at Ely, Minn., 700,000; Mesabi range at Ely, Minn., 400,032; and the Mountain Iron at Mountain Iron, Minn., on the same range, 650,021 tons. Of the total the Mesabi contributed almost one third.

Alcoa Will Cut Quotas in First Quarter by 25 pct

Pittsburgh

• • • **Aluminum Co.** of America will reduce allocations to customers during the early months of 1949. R. V. Davies, Alcoa's vice-president and general sales manager blamed the cuts on increasing demand and short supply. He added that if current demand continues there can be no appreciable improvement before mid 1949.

A check of consumers shows that sheets will be hardest hit, with first quarter quota cuts slashed by 25 pct or more except to consumers with military orders. Extrusions, forgings and rolled shapes will be about as tight as sheets. Castings will generally take small cuts, if any. Reductions in wrought products will be bigger than those in castings, perhaps 10 pct below current levels.

Mr. Davies gave five reasons for the new tightness in aluminum: (1) Military orders are increasing; (2) droughts in Canada will reduce imports from there at least during the early months of next year; and (3) Alcoa's production capacity will be reduced by about 40 million lb annually when its Niagara Falls smelting works are closed in February because electric power will no longer be available. He also mentioned hydroelectric power shortages in this country and declining scrap supplies.

Box car builder saves $2925 a day —CAN YOU?

General Electric's money-saving pack of facts: manual—film—review booklets.

RESISTANCE WELDING

Get these facts to your key men and see how much you can save

- WITH RESISTANCE WELDING, a box car builder cut costs by $2925.
- WITH RESISTANCE WELDING, a small transformer manufacturer saved $84,000 per year.
- WITH RESISTANCE WELDING, a radio tube maker stepped production up to an *unprecedented* 2,500 per day.

In your plant, too, savings and production feats like these are possible—when your key personnel *know* the up-to-the-minute facts on resistance welding—*know* how to put them to work on your problems. And it's so easy to get the facts to them *now*—at no cost.

FREE to business management

Examine the General Electric *Resistance Welding Manual* free of charge. It covers every phase of resistance welding from a glossary of welding terms to specific industrial applications in plants like yours. It tells *where* resistance welding can be used—*how* it can be used—exactly *what* benefits you can expect from it. It's written by experts, *without sales bias*, in a language your men can easily understand. Look through it. Satisfy yourself that it will pay off.

Get a FREE showing of the film

Your key personnel will get a kick learning the newest facts about resistance welding in this modern, absorbing, *visual* way. Here's a General Electric sound film in full color that wallops across its ideas — actually *shows* you how resistance welding is building better products for less in plants like yours. It's prepared by resistance-welding specialists in terms that are grasped readily. Show it to your key men.

ACT NOW! Don't delay. Remember — resistance welding saves you money in *five* ways—and does a better job, too. So start the ball rolling by filling in the coupon below and we'll rush you a copy of the G-E *Resistance Welding Manual*. *And*, with it, we'll tell you how to arrange for a free showing of the film.

FREE TO BUSINESS MANAGEMENT

Attach to your business letterhead

General Electric Co.
Section J684-10
Schenectady 5, N. Y.

Please send me a sample copy of the G-E *Resistance Welding Manual* without cost or obligation, with details on how I can arrange for a FREE SHOWING of the film. (Extra copies at regular manual price—$1.00.)

Name__________ Title__________
Company__________
Street__________
City__________

GENERAL ELECTRIC

Bituminous Coal Board Authorizes Budget For Market Research Group

Pittsburgh

• • • The Board of Directors of the Bituminous Coal Research, Inc., has authorized a research budget of more than $500,000 for the second consecutive year, according to J. B. Morrow, BCR president. It is the purpose of the board to create new markets for bituminous coal and to hold and expand present markets.

This authorization finances the development of new equipment, methods for more efficient coal utilization, and fundamental research. The funds for BCR research are provided by 340 coal companies, railroads, and manufacturers.

The program outlined by BCR executives at the board's annual budget meeting yesterday in Pittsburgh, authorizes the expenditure of $515,800 to continue the industry-sponsored general research program for 1949.

This budget is exclusive of the programs being conducted by the BCR Mining Development and Locomotive Development committees. The authorized budget does not include substantial sums made available by co-sponsors on certain projects of the general research program.

The work proposed for the coming year is for the most part a continuation of the 1948 program. Attention will be given to further development and commercial introduction of residential heating equipment, new methods of industrial coal utilization, and improved performance of steam locomotives.

Several new projects will be undertaken in 1949, including work on cinder collectors for small plants and locomotive fuel studies. BCR, in cooperation with Battelle Memorial Institute and others, will initiate a program on improved gas producers. Many of BCR's general research projects are conducted at Battelle.

Cooperative research will be conducted with other solid-fuel associations and groups of manufacturers on projects of mutual importance.

Support has been continued to BCR-sponsored fundamental research in coal gasification, com-

106 cost-saving ways to use electronics

Down-to-earth course trains your personnel to apply them in your plant

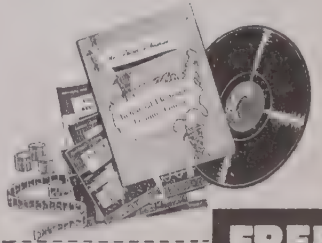
To get the most out of electronic equipment, your personnel must thoroughly understand its fundamentals, advantages, and limitations. To help you with this training problem, General Electric has prepared a complete, easy-to-take visual course in industrial electronics.

Here's what the G-E electronics training course offers—

1. **A 146-page instructor's manual,** designed to give your employees a *practical* understanding of the fundamentals of electronics...tell them how they're applied in modern industry. It enables a member of your organization to conduct the 12-lesson course.
2. **Twelve Slidefilm Lessons** each with its own record. The lessons are phrased in non-technical language ...devoted to *specific applications*.
3. **Twelve Review Booklets,** illustrated, for reference and home study.

Free inspection offer—

Once you've seen the scope of this fact-packed course, we know you'll be convinced it will pay off for you. So, examine the instructor's manual *without obligation*. After you've seen it, you will want to order the complete course which is offered at cost... only $120.00.



FREE TO BUSINESS MANAGEMENT

Attach to your business letterhead

General Electric Co.
Section J684-5
Schenectady 5, N. Y.

Please send me a sample copy of the G-E *Industrial Electronics Training Course Manual* (GES-3330) without cost or obligation.

Name__________ Title__________
Company__________
Street__________
City__________

GENERAL ELECTRIC

WAREHOUSE STOCKS OF

ALLOY BARS

ROUNDS
SQUARES
HEXAGONS

Hot Rolled.
½" to 10" Rd.

Cold Drawn.
⅛" to 4½" Rd.
3/16" to 2" Sq.
⅜" to 2½" Hex.

AIRCRAFT

AMS—6260
6270
6272
6280
6322
6324
6415
6320 Hex.

BESSEMER

B1113

CARBON

1045 H.R.

FORGINGS

WRITE FOR OUR MONTHLY STOCK LIST

HY-ALLOY STEELS CO.

30 N. LASALLE
CHICAGO 2, ILL.
RAN 5253

bustion and hydrogenation at the Coal Research Laboratory of Carnegie Institute of Technology and at the Massachusetts Institute of Technology, as well as studies of mine drainage at the U. S. Bureau of Mines and West Virginia University. BCR's support of cooperative house-planning research at the University of Illinois, a project leading to greater satisfaction from the use of coal by residential consumers, will be continued.

In announcing the 1949 Budget, J. B. Morrow, BCR president, said that the national research organization of the bituminous coal industry will continue research to increase public acceptance of coal as a fuel, to develop new coal-utilization processes and equipment, and to stimulate and assist research programs by other organizations which have objectives that will improve the competitive position of the coal industry.

Extend Deadline on Bids For Some Egyptian Scrap

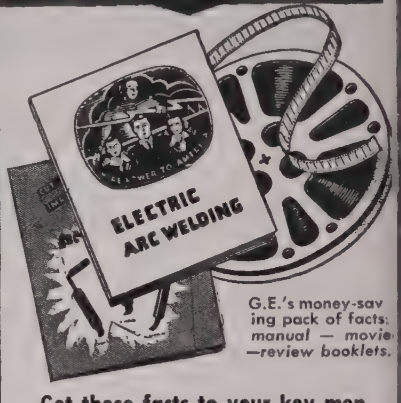
Washington

• • • A total of 30,000 tons of scrap steel in Egypt is available for purchase by American firms, according to Alex Miller, adviser on scrap iron and steel to the Office of Industry Cooperation.

Bids on this scrap were first invited by the Egyptian State Railway Administration in October with a closing date of Nov. 1. This deadline has now been extended to Dec. 18, 1949. The steel scrap consists of miscellaneous lots in the Egyptian State Railway scrap yard at Alexandria. Offers for direct purchase of the scrap will be considered on the condition that the price be paid in dollars and within one week from the date of notification to the bidder.

American purchasers will be granted the required export licenses and exemption from export taxes by the Egyptian government, Mr. Miller pointed out. Delivery of scrap lots would be on the site with all costs, such as transport and loading, to be borne by the purchaser. All communications conerning this Egyptian scrap offer should be addressed to the Egyptian State Railway Administration, Stores Dept., Cairo Station, Cairo; to Gabbary Stores, Alexandria, or to the Office of the Chief Inspecting Engineer, London.

METAL FABRICATOR CUTS COSTS 67 PER CENT —CAN YOU?



G.E.'s money-saving pack of facts: manual — movie —review booklets.

Get these facts to your key men and see how much you can save

- **WITH ARC WELDING, a fabricator cut costs on one large metal part by 67%.**
- **WITH ARC WELDING, a truck builder slashed production on dump trailer bodies to an unprecedented 15 hours.**

In *your* plant, too, savings like these in time and money are possible—when your key personnel *know* the up-to-the-minute facts on arc welding—*know* how to put them to work on your problems. And it's so easy to get the facts to them *now*—at no cost to you!

***FREE* to business management**
Examine the General Electric *Electric Arc Welding Manual* free of charge. It covers every phase of arc welding from a list of welding services for the user to specific examples of production feats in plants like yours. It provides *up-to-date* data about available equipment, power supply requirements, design and safety measures. It's written by experts, *without sales bias*, in a language your men can easily understand. Look through it. Satisfy yourself that it will pay off in your plant, then—

Get a *FREE* showing of the film
Your key personnel will enjoy learning the newest facts on arc welding in this modern, absorbing, *visual* way. Here's a thirty-minute General Electric sound film in full color that wallops across its ideas—actually *shows* you precisely how arc welding is building better products cheaper in plants like yours. It's prepared by arc-welding specialists in terms that are grasped readily. Show it to your key men and—

Get *FREE* review booklets
They're ideal for individual study and review. Have as many as you like, but—

ACT NOW! Don't delay. Remember—today's arc welding offers you unprecedented opportunities to cut costs, improve quality, lick difficult production problems. So start the ball rolling by filling in the coupon below, and we'll rush you a copy of the G-E *Electric Arc Welding Manual*. Do it *now!*

FREE TO BUSINESS MANAGEMENT

Attach to your business letterhead

General Electric Co.
Section M684-9
Schenectady 5, N. Y.

Please mail me a sample copy of the G-E *Arc Welding Manual* without cost or obligation, with details on how I can arrange for a FREE SHOWING of the film. (Extra copies at regular manual price—$1.25.)

Name__________Title__________
Company__________
Street__________
City__________

GENERAL ELECTRIC

Navy Undertakes Study To Determine the Short Time Overload of Gears

Pittsburgh

• • • **The short time** overload ability of some kinds of machines can be determined easily. But with others, such allowable overloadings are almost impossible to find out. Although gears are in this class, the U. S. Navy recently undertook a program to investigate this characteristic.

Two sets of standard 6000 hp gears made for naval escort vessels were available as surplus from war stock. They were identical except for the different tooth cutting methods used by the two manufacturers. One of the gear units was built by Westinghouse to the same standard as the larger gears for our biggest fighting ships. These two sets of gears were mounted by the Navy in the Naval Boiler and Turbine Laboratory in Philadelphia in a "front-to-front" arrangement (similar to electrical pump back tests) so that one set loaded the other, and were driven at normal, rated full speed.

Tests of 100-hour duration were run, the loading being increased for successive tests. It was not until they had been loaded to 340 pct of normal that teeth on the bull gear failed. It had operated almost 3000 hr at loads up to nearly 3½ times normal. Even at this point the first reduction gears and pinions showed no signs of tooth distress and were capable of carrying full load indefinitely. No journal bearing failures developed during this extreme test.

These tests indicate that the smoother tooth surface as provided by lapping or shaving has a considerable value in increasing the resistance to pitting, and little effect on the ultimate ability of the gear to carry load. The tests also proved that a long run-in period of operation at light load to achieve a work hardening of the teeth surfaces is not necessary to achieve high load-carrying ability.

Such data will enable gear engineers to design gears more rationally for service requiring short intervals of extreme overloads, such as occur in naval service but seldom occur in other marine or industrial applications.

Perforated Strainers and—

HENDRICK is fully equipped to fabricate a wide range of products from perforated plate, that also involve shaping, forming, welding, riveting, brazing, etc. The pump strainer illustrated is a typical example.

For such operations Hendrick has an exceptionally large stock of dies and patterns, complete tool equipment, and ample forming and welding facilities.

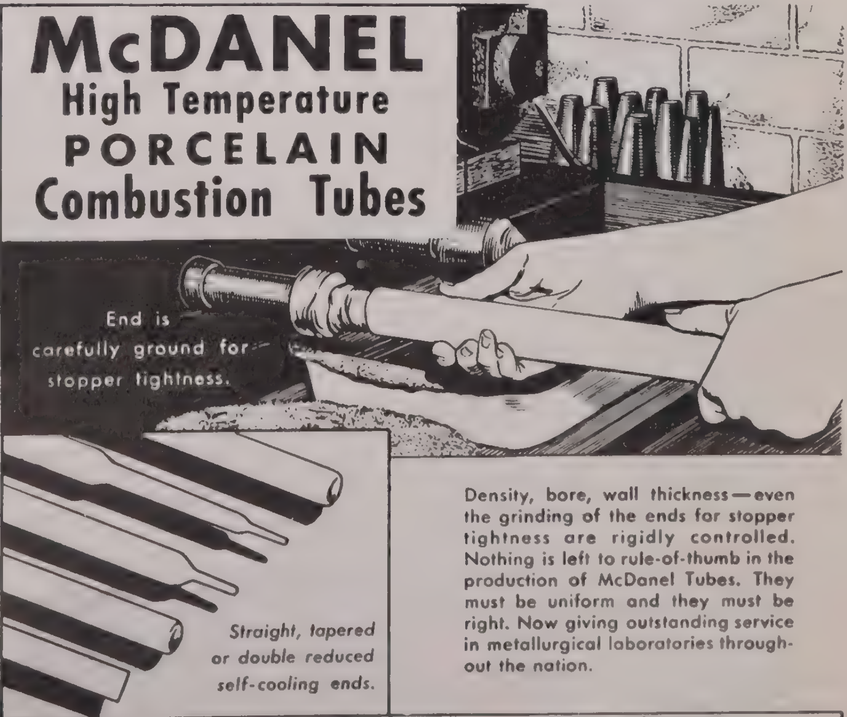
Write for detailed information.

See our catalog in SWEET'S

Perforated Metals
Perforated Metal Screens
Architectural Grilles
Mitco Open Steel Flooring,
"Shur-Site" Treads and
Armorgrids

HENDRICK
Manufacturing Company
37 DUNDAFF STREET, CARBONDALE, PENNA.
Sales Offices In Principal Cities

McDANEL
High Temperature
PORCELAIN
Combustion Tubes



End is carefully ground for stopper tightness.

Straight, tapered or double reduced self-cooling ends.

Density, bore, wall thickness—even the grinding of the ends for stopper tightness are rigidly controlled. Nothing is left to rule-of-thumb in the production of McDanel Tubes. They must be uniform and they must be right. Now giving outstanding service in metallurgical laboratories throughout the nation.

OTHER McDANEL PRODUCTS

High Temperature Combustion Tubes.

Self-cooling Combustion Tubes.

Refractory Porcelain Specialties in stock or designed to meet specific needs.

Specify McDanel High Temperature Combustion Tubes from your supplier.

McDANEL REFRACTORY PORCELAIN CO.
BEAVER FALLS PENNSYLVANIA

The heart of the Fabricating shop!

Fabricators and Car Builders agree that material handling time is the chief factor in the *economics of production.*

The Thomas Automatic Spacing Machine is the solution to the handling problem. In addition it eliminates the need for marking and assures proper spacing of rivet holes in limitless number of pieces. Thus costs are substantially reduced and production speeded.

Write for Bulletin 306

THOMAS
MACHINE MANUFACTURING COMPANY
PITTSBURGH, 23, PA.

16

For Safe and Economical Results, Use . . .

-Preformed-

"HERCULES" (RED-STRAND) WIRE ROPE

The experience of many wire rope users has proved that they can depend on Preformed "Hercules" (Red-Strand) Wire Rope for top-flight performance. Its easy handling . . . its smooth spooling . . . its unusual endurance — make for faster work, longer life and lower operating cost.

We Invite Your Inquiries

"HERCULES" (RED STRAND) the DEPENDABLE WIRE ROPE for any TOUGH JOB

MADE ONLY BY
A. LESCHEN & SONS ROPE CO.
ESTABLISHED 1857
5909 KENNERLY AVENUE • ST. LOUIS 12, MISSOURI
New York 6 Los Angeles 21 Houston 3 Chicago 7 Denver 2 San Francisco 7 Portland 9 Seattle 4

ASM Putting Finishing Touches on Its Plans For Western Metal Show

Cleveland

• • • **Final Committee** appointments for the coming Western Metal Congress and Exposition have been made, according to an announcement by W. H. Eisenman, National Secretary, American Society for Metals, and Managing Director of the event.

The General Committee, having the responsibility of directing overall policy of the Exposition, is headed by E. R. Babylon, the Kaiser Co. Two vice chairmen on this committee are James B. Morey, International Nickel, and S. R. Kallenbaugh, Timken Roller Bearing Co. W. J. Parsons, Pacific Scientific Co., will serve as secretary of the committee.

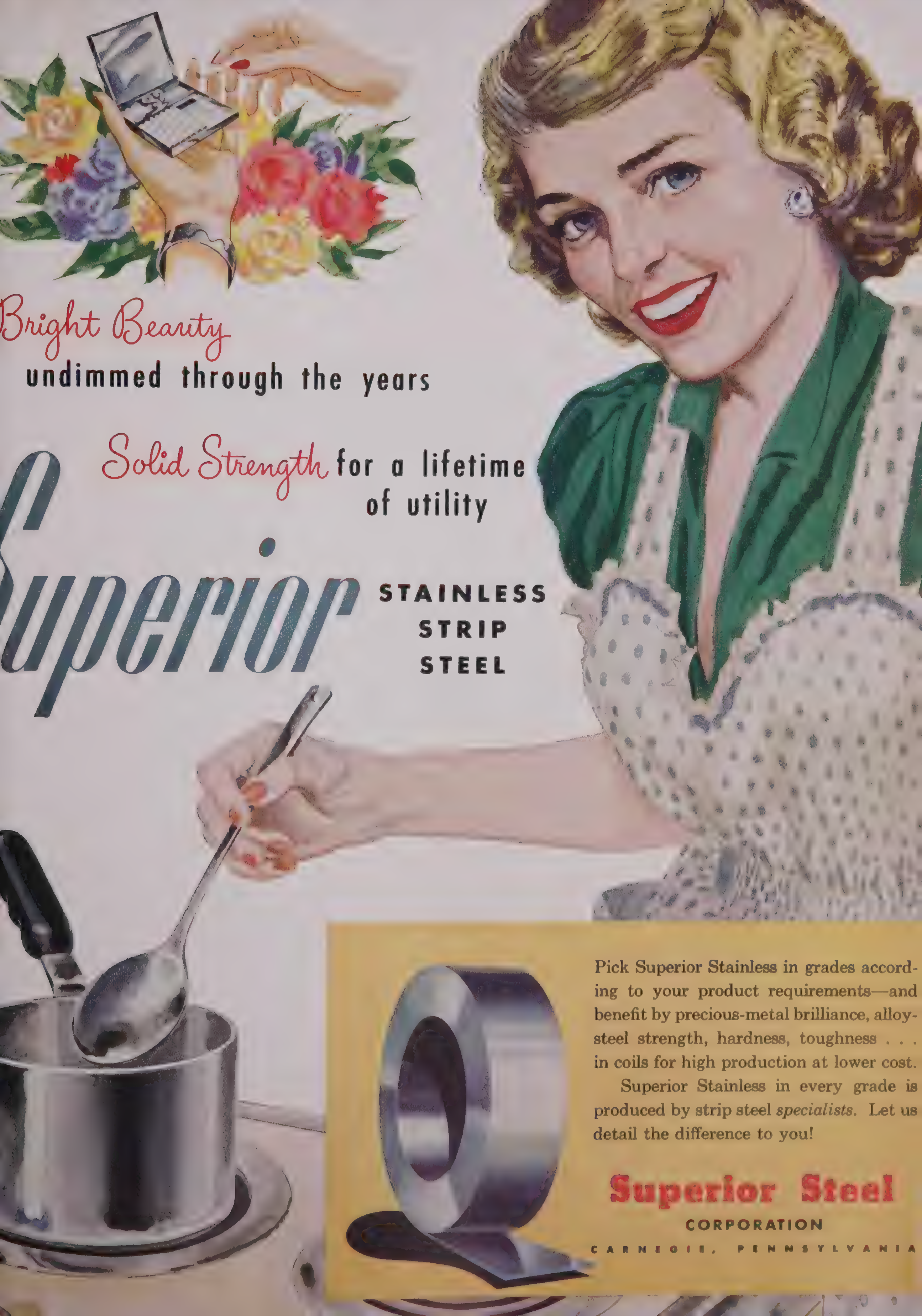
Nine ASM chapter chairmen will assist on Mr. Babylon's group—Stuart C. Gillespie, Pacific Metal Co., Seattle, Puget Sound Chapter; C. R. St. John, Permanente Metals Corp., Spokane, Inland Empire Chapter; B. L. Berlien, Industrial Steel Treating Co., Oakland, Golden Gate Chapter; R. J. A. Fricker, Wominion Bridge Co., Vancouver, British Columbia Chapter; Raymond C. Aungst, Oregon Brass Works, Portland, Oregon Chapter; H. E. Fryer, Carnegie - Illinois Steel Corp., Denver, Rocky Mountain Chapter; Howell Drummond, Colorado Fuel & Iron Corp., Pueblo, Pueblo Chapter; Earl Kops, Kops Engineering Service, San Diego, San Diego Chapter; Winfred C. Dyer, Utah Chapter.

Other Committee Chairmen include Los Angeles Executives: Harry H. Beyma, the Kaiser Co., Attendance Committee; Edgar Brooker, U. S. Spring & Bumper Co., Cooperating Societies Committee; W. W. Farrar, Farbest Corp.

Buffalo Forge Dividend

Buffalo

• • • **The Buffalo** Forge Co. declared a dividend of 25 cents a share on the outstanding common stock, bringing total distribution for the calendar year to $4, compared with $3.45 in 1947. Payment will be made Dec. 28 to stock of record Dec. 10.


Bright Beauty
undimmed through the years
Solid Strength for a lifetime
of utility
uperior
STAINLESS
STRIP
STEEL

Pick Superior Stainless in grades according to your product requirements—and benefit by precious-metal brilliance, alloy-steel strength, hardness, toughness . . . in coils for high production at lower cost.

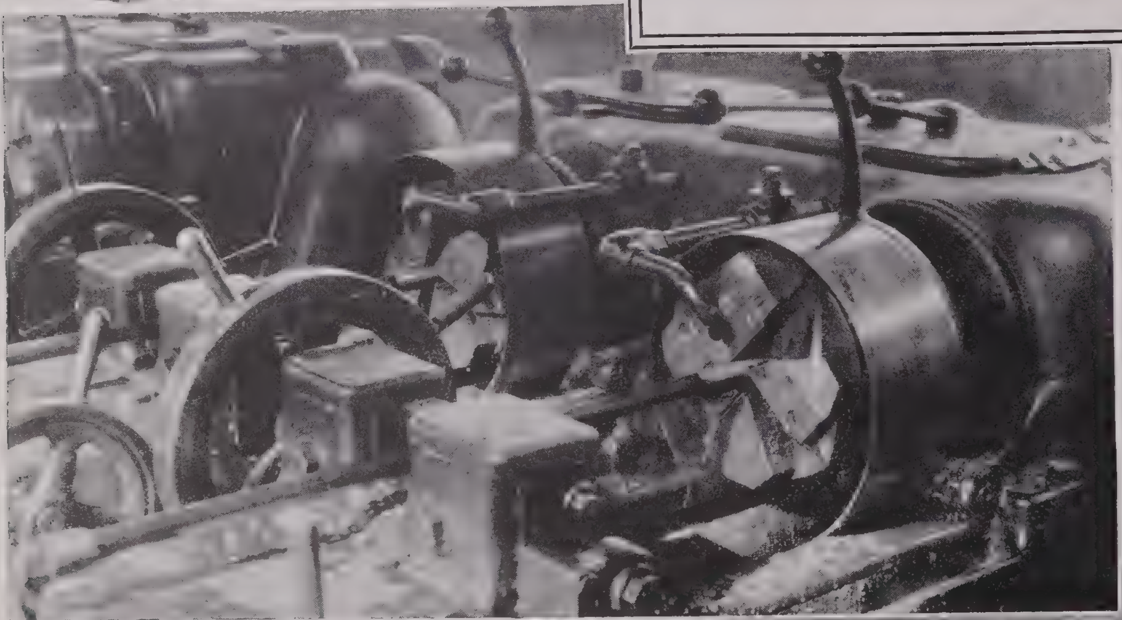
Superior Stainless in every grade is produced by strip steel *specialists*. Let us detail the difference to you!

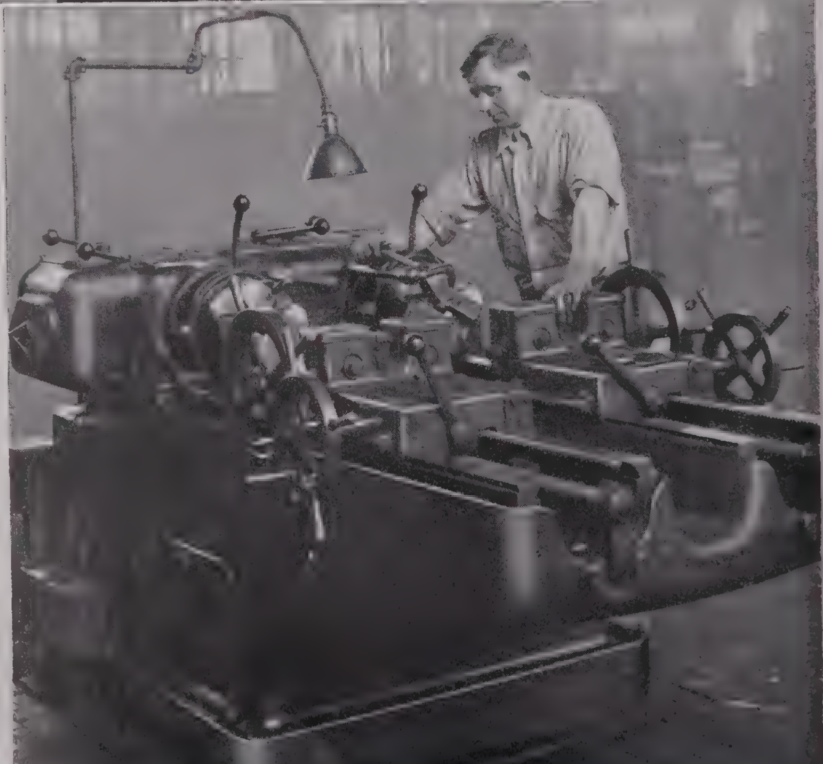
Superior Steel

CORPORATION

CARNEGIE, PENNSYLVANIA

Locomotive Manufacturers and Railroad Shops Use LANDIS Threading Machines, Die Heads and Chasers for their Threading Needs

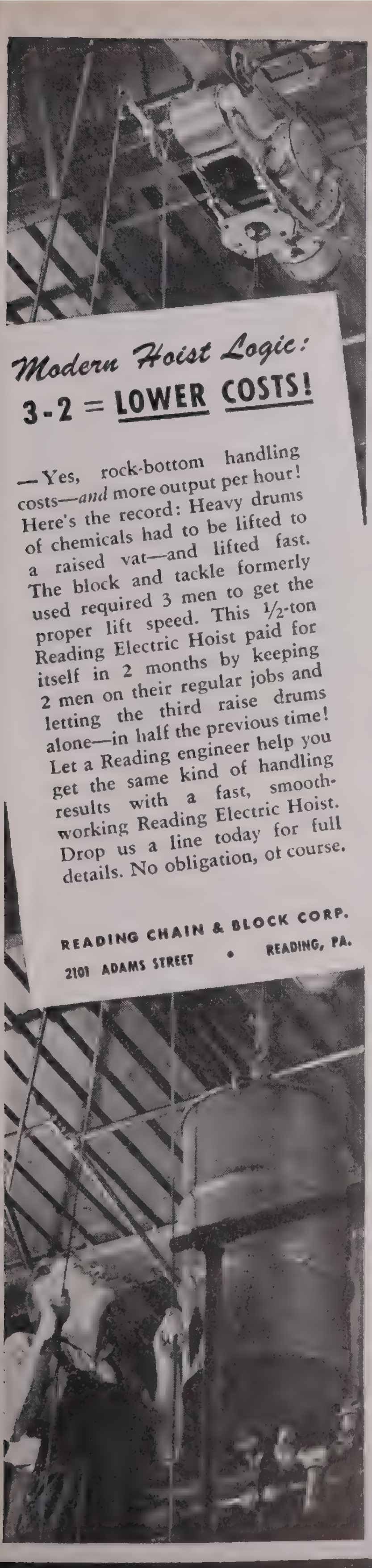




Landmaco Threading Machines are used exclusively in many railroad shops throughout the country for threading radial crown bolts, staybolts, and boiler studs. The outstanding design of the LANDMACO Machine, together with the inherent qualities—accuracy and economy—of the Landis long life Tangential Chaser which it employs, assures the lowest possible thread-cutting cost.

Write for Bulletin "LANDIS"
for Threading in Railroad Maintenance

LANDIS
MACHINE COMPANY
WAYNESBORO, PA., U.S.A.



Modern Hoist Logic:
3-2 = LOWER COSTS!

—Yes, rock-bottom handling costs—*and* more output per hour! Here's the record: Heavy drums of chemicals had to be lifted to a raised vat—and lifted fast. The block and tackle formerly used required 3 men to get the proper lift speed. This ½-ton Reading Electric Hoist paid for itself in 2 months by keeping 2 men on their regular jobs and letting the third raise drums alone—in half the previous time! Let a Reading engineer help you get the same kind of handling results with a fast, smooth-working Reading Electric Hoist. Drop us a line today for full details. No obligation, of course.

READING CHAIN & BLOCK CORP.
2101 ADAMS STREET • READING, PA.

READING HOISTS

AISI Reports Shipments Of Steel Break Records

New York

• • • **Shipments** of steel products in the first 10 months of 1948 increased 1,879,000 net tons over the similar 1947 period to 54,183,000 tons, according to American Iron and Steel Institute.

Shipments in the final 2 months of the year at the same rate as prevailed a year ago, or slightly less than the October rate, would place the total for the year above 65 million tons, which would be about 2 million tons greater than in 1947, and a record for any year.

Total shipments of steel products in October were 5,952,000 tons, at a rate equivalent to over 70 million tons a year. Shipments in September were 5,511,000 tons and in October, 1947, they were 5,682,000 tons. October shipments were only 26,000 tons less than the peak made in March, 1948.

Greatest increases in tonnage of shipments so far this year over the corresponding months in 1947 have been in sheets and pipe. Shipments of hot and cold rolled sheets and galvanized sheets in 10 months gained more than a million tons over the similar 1947 period, to 13,403,000 tons. Sheets also constituted a greater proportion of total shipments, being 24.7 pct, against 23.6 pct a year earlier. Larger shipments of sheets were due almost entirely to an increase in cold rolled sheets.

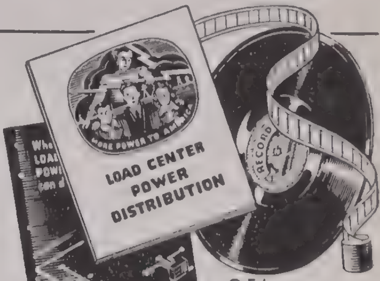
Shipments of pipe and tubes, particularly important to the oil and construction industries, were 5,631,000 tons in 10 months, or 10.4 pct of total shipments, compared with 5,025,000 or 9.5 pct in the corresponding 1947 period.

Gray Iron Founders Meet

Dayton

• • • **Use** of gray iron in manufacture of tools and dies has outstanding advantages, including good castability, high compressive strength, wear-resistance and ability for selective hardening, C. O. Burgess, technical director, Gray Iron Founders' Society, told the National Tool & Die Manufacturers' Assn. here. He emphasized the necessity for close cooperation between designers and foundry engineers in developing tools and dies.

One manufacturer saved $10,400 in power equipment—*CAN YOU?*



G.E.'s money-saving pack of facts on power distribution systems: manual — slidefilm — review booklets.

Get these eye-opening facts on power distribution systems to your key men—and see how much YOU can save

With "load-center" power distribution, one medium-sized manufacturer saved $10,400 in power equipment costs! Another cut equipment costs by 15 per cent—another by 17 per cent. *And* load-center systems help save money in *five other* ways, too. So get the facts to your key men *now*—open their eyes to this new way to power economy in your plant. It's easy. Here's all you do—

FREE to business management

Examine the General Electric *Load-Center Power Distribution Manual* free of charge. It covers every phase of load-center systems from a discussion of the fundamentals to examples of actual installations in plants like yours. It's prepared by experts, *without sales bias*, and it's designed to help you solve *your* power problems. Look through it. Satisfy yourself that it will pay off for you, then—

Get a *FREE* showing of the slidefilm

Your key men will quickly learn about power distribution systems in this modern, absorbing, *visual* way. Here's a General Electric slidefilm *with sound* that tells *what* load-center distribution is—*what* it can do for you. Prepared in terms that get over fast—stick in the memory. Show it, and—

Get *FREE* review booklets

They highlight the lessons of the film, and they're ideal for individual study and review. You can have as many as you like.

ACT NOW! Don't delay. Remember—load-center distribution means *reduced costs.* So start the ball rolling, by filling in the coupon below, and we'll rush you G.E.'s *Load-Center Power Distribution Manual.* And, with it, we'll tell you how to arrange for a free showing of the slidefilm. *Do it now!*

Attach to your business letterhead

FREE TO BUSINESS MANAGEMENT

**General Electric Co.
Section K684-11
Schenectady 5, N. Y.**

Please send me a sample copy of the G-E *Load-Center Power Distribution Manual* without cost or obligation, with details on how I can arrange a FREE SHOWING of the film. (Extra copies at regular manual price—$1.00.)

Name________ Title________
Company
Street________
City________

GENERAL ELECTRIC

MACHINE TOOLS

. . . News and Market Activities

Orders Slipping and Backlogs Diminishing in Spotty Market

Installation of Cost-Saving Equipment in Some Plants Viewed as Shot in Arm

◦ ◦ ◦

• • • **Sales outlook** continues spotty in major sales sectors of the machine tool industry, with orders slipping and backlog diminishing in some plants, while others report increased inquiries and quotations.

Some machine tool sales executives believe that plant layoffs, which have become rather numerous in some industries, notably home appliances, make such industries good potential customers for the latest cost-saving equipment. According to reports, General Electric Co. will retool for a new model refrigerator, and if this may be taken as a token, the machine tool business is due for a shot in the arm.

While ECA approved during November about $10 million in purchase and reimbursement authorizations, arrangements for purchase and delivery are apparently keeping most of this business from getting to the industry. About $2,100,000 of these procurements were approved for first quarter 1949 delivery and $5,500,000 for the second quarter.

In Detroit many machine tool sources have a watchful eye out for any year-end buying by firms with some extra money in the till. Thus far, the results have not been too encouraging, although there are indications that a substantial volume of new orders may materialize before the end of the present tax year.

Present indications are that placements for the new Chevrolet transmission operation at Saginaw will be nearly completed by the end of the month. Other transmission programs are quiet, although it is expected that the Studebaker program may get under way shortly after the start of the new year.

Chrysler is reported to be buying some new equipment at Lunch Road and quotations on new machines have been requested by Kaiser-Frazer.

In Cleveland, active committees of the National Machine Tool Builders Assn. for 1949 were announced by L. D. McDonald, president of NMTBA and vice-president, Warner & Swasey Co.

A. G. Bryant, retiring president of NMTBA and vice-president, Cleereman Machine Tool Co., Chicago, will be chairman of the government relations committee of NMTBA. This committee's objective is to inform Congress and the administrative department of the government on the machine tool industry and to advise machine tool builders regarding developments in Washington.

Other government relations committee members are: M. A. Hollengreen, president, Landis Tool Co.; L. W. Scott Alter, president and general manager, American Tool Works Co.; Ferris M. Angevin, treasurer, Cincinnati Milling Machine Co.; David Ayr, president and general manager, Hendey Machine Co., W. M. Fairbairn, president and general manager, Barnes Drill Co., and M. M. Smith, president, E. W. Bliss Co.

Public relations committee members are: L. W. Scott Alter, chairman; Alfred V. Bodine, president and treasurer, Bodine Corp.; Ralph J. Kraut, president and general manager, Giddings & Lewis Machine Tool Co.; R. W. Glasner, president, Clearing Machine Corp., and Helge G. Hoglund, general sales manager, the Heald Machine Co.

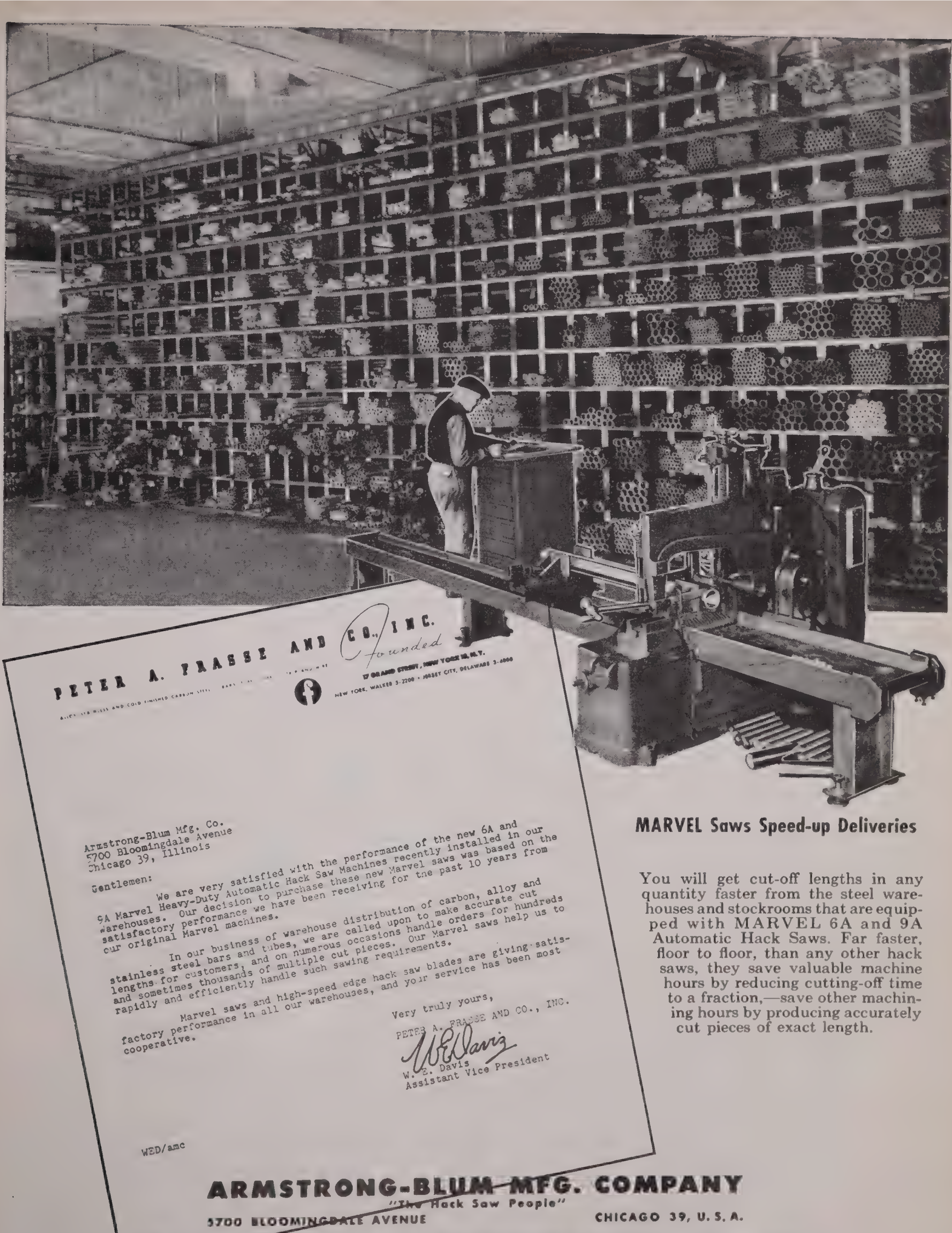
Sales and Service committee members are: James C. Herbert, sales manager, Jones & Lamson Machine Co., chairman; Daniel R. Weedon, assistant manager, Blanchard Machine Co., Swan E. Bergstrom, vice-president, Cincinnati Milling & Grinding Machines, Inc.; C. Denson Day, sales manager, Norton Co.; Donald M. Pattison, vice-president in charge of sales, Warner & Swasey Co., and Jerome A. Raterman, president, Monarch Machine Tool Co.

Qualifications for membership and exhibits committee: Richard E. LeBlond, president, R. K. LeBlond Machine Tool Co., president; Swan E. Bergstrom; Paul R. Hatch, general sales director, Brown & Sharpe Mfg. Co.; George H. Johnson, president, Gisholt Machine Co., and Frank K. Simmons, president, Henry & Wright Mfg. Co.

Apprentice Training Standards: J. Edward Goss, Brown & Sharpe Mfg. Co., chairman; Robert B. Carmichael, supervisor of apprentices, Pratt & Whitney; Kenneth H. Casson, personnel manager, Barnes Drill Co.; Charles R. DeVlieg, secretary, DeVlieg Machine Co., and Edward W. Gressle, personnel manager, Warner & Swasey Co.

Technical Standards Committee: M. H. Arms, chief engineer, Bryant Chucking Grinder Co., chairman; Harold J. Siekmann, chief engineer, R. K. LeBlond Machine Tool Co., and J. Robinson, chief engineer, Vickers, Inc.

Standardization of Hydraulic Elements Committee: J. Robinson, chairman; Earl Cannon, manager hydraulic division, Clearing Machine Corp.; Albert H. Dall, assistant research director, Cincinnati Milling Machine Co.; Bengt Granberg, chief development engineer, Sundstrand Machine Tool Co.; Benjamin P. Graves, director of design, Brown & Sharpe Mfg. Co.; Ralph E. Price, assistant chief engineer, Landis Tool Co.; R. A. Schafer, Chief Development engineer, National Automatic Tool Co., Inc., and Ernst Wiedmann, chief engineer, the Oilgear Co.



PETER A. FRASSE AND CO., INC.

Founded

ALLOY, STAINLESS AND COLD FINISHED CARBON STEEL · BARS [illegible] AND WIRE

17 GRAND STREET, NEW YORK 13, N.Y.
NEW YORK, WALKER 5-2200 · JERSEY CITY, DELAWARE 3-6000

Armstrong-Blum Mfg. Co.
5700 Bloomingdale Avenue
Chicago 39, Illinois

Gentlemen:

We are very satisfied with the performance of the new 6A and 9A Marvel Heavy-Duty Automatic Hack Saw Machines recently installed in our warehouses. Our decision to purchase these new Marvel saws was based on the satisfactory performance we have been receiving for the past 10 years from our original Marvel machines.

In our business of warehouse distribution of carbon, alloy and stainless steel bars and tubes, we are called upon to make accurate cut lengths for customers, and on numerous occasions handle orders for hundreds and sometimes thousands of multiple cut pieces. Our Marvel saws help us to rapidly and efficiently handle such sawing requirements.

Marvel saws and high-speed edge hack saw blades are giving satisfactory performance in all our warehouses, and your service has been most cooperative.

Very truly yours,

PETER A. FRASSE AND CO., INC.

W E Davis

W. E. Davis
Assistant Vice President

WED/amc

MARVEL Saws Speed-up Deliveries

You will get cut-off lengths in any quantity faster from the steel warehouses and stockrooms that are equipped with MARVEL 6A and 9A Automatic Hack Saws. Far faster, floor to floor, than any other hack saws, they save valuable machine hours by reducing cutting-off time to a fraction,—save other machining hours by producing accurately cut pieces of exact length.

ARMSTRONG-BLUM MFG. COMPANY
"The Hack Saw People"
5700 BLOOMINGDALE AVENUE CHICAGO 39, U. S. A.

MARVEL *Metal Cutting* SAWS

Better Machines—Better Blades

Scrap Drops Further; Volume of Buying for Conversion Lower

New York

• • • **For the second** week in succession, scrap prices for some metals have dropped by ½¢ per lb, reflecting the lower volume of buying for conversion operations. Scrap copper and brass is flooding into refineries and ingot makers, thrown on the market by producers and dealers who had been holding for higher prices but who are now convinced that lower prices are in prospect. The price reductions affected copper and aluminum scrap, but there is no oversupply of the latter. Refineries have reduced offerings for No. 1 copper to 20½¢ and ingot makers dropped composition to 16½¢. Ingot makers were paying 16¢ for mixed aluminum old cast and old clips. Lead smelting charges are reported to range from $10 to $25 a ton. Dealers say that the scrap market is very uncertain when they attempt to buy at prices based on the new buying levels.

No changes were made in the prices of brass and bronze or aluminum ingot as the result of the new scrap prices. There is not much business on hand for either metal as foundries are already well supplied. The indications are that ingot business may not pick up until mid-January.

The decline in copper scrap prices has been a boon to custom smelters who are now able to go into the market for their own account in order to sell at the 23.50¢ price. It is permitted by the smaller volume of scrap buying by consumers for conversion purposes. Consumers have been alarmed by the growing wave of curtailed buying in the consumer and durable goods industries and are not anxious to add to their inventories of high priced metals in such a market.

Refineries Flooded with Scrap Thrown on Market by Those Biding Higher Prices

○ ○ ○

Copper, lead and zinc consumers are still having great difficulty in obtaining metal but producers report that they are not pressing as actively as in recent months due to the recognition of the shortages. The Kennecott strike is continuing without any indication of an early ending. The mediators have proposed a study for job evaluation on which new wage rates could be set. A study of this nature would take some time but it is possible that if accepted by union and management, the early return of strikers pending completion of the study might be possible. Producers have been able to hold the price at 23.50¢ despite heavy demand. Now it is clear that the pressure is off the premium market. Foreign demand for copper is lighter and some producers expect to make no further sales before the first of the year.

Zinc consumers received some good news when they learned that the Australian producers had decided to export half their production next year, and limiting their shipments to Australian consumers to the remaining production. This development was caused by the continuation of the home zinc ceiling price at 3½¢ per lb. Demand for most grades of zinc has been very heavy, especially on the part of galvanizers. Some easing has appeared in the demand for the die casting grade. Offerings of foreign High Grade zinc have been made at 19¢ plus duty and transportation to the Valley. This price would reach well above the delivered price for domestic metal at 18.50¢.

Nonferrous Metals Prices

	Dec. 15	Dec. 16	Dec. 17	Dec. 18	Dec. 20	Dec. 21
Copper, electro, Conn.	23.50	23.50	23.50	23.50	23.50	23.50
Copper, Lake, Conn.	23.625	23.625	23.625	23.625	23.625	23.625
Tin, Straits, New York	$1.03	$1.03	$1.03	$1.03	$1.03	$1.03
Zinc, East St. Louis	17.50	17.50	17.50	17.50	17.50	17.50
Lead, St. Louis	21.30	21.30	21.30	21.30	21.30	21.30

Lead consumers are still suffering from the effect of the St. Joseph Lead Co. strike, but the premium market is on the downgrade. This is reflected in the wide range quoted in smelting charges to be deducted by smelters from the price of primary metal realized on scrap. Some smelters are apparently able to get scrap with a smelting charge set at $20 to $25. Others have reduced their smelting charge to as low as $5 to $10 a ton.

The first evidence of the attitude to be taken by domestic producers toward the continuation of the copper tariff suspension was given by a statement made by Louis Cates, chairman, Phelps Dodge Corp. Mr. Cates favors the continuation of the tariff suspension as a means of holding down further increases in the copper price.

•

Short of Aluminum

Seattle

• • • **Pacific Northwest** users of aluminum have been warned that they are in for a more acute shortage than they are now experiencing. R. V. Davies, vice-president of Aluminum Co. of America, places a large part of the responsibility for the scarcity of aluminum on the power shortage in Canada which is said to be even more critical than the local one. Aluminum producers have had to restrict export of this product because of their reduced operations.

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, 10,000 lb, freight allowed	17.00
Aluminum pig	16.00
Antimony, American, Laredo, Tex.	38.50
Beryllium copper, 3.75-4.25% Be dollars per lb contained Be	$24.50
Beryllium aluminum 5% Be, dollars per lb contained Be	$52.00
Cadmium, del'd	$2.00
Cobalt, 97-99% (per lb)	$1.65 to $1.72
Copper electro, Conn. Valley	23.50
Copper, lake, Conn. Valley	23.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$110 to $115
Lead, St. Louis	21.30
Lead, New York	21.50
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, carlots	34.50
Mercury, dollars per 76-lb flask, f.o.b. New York	$79 to $81
Nickel, electro, f.o.b. New York	42.90
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$89 to $93
Silver, New York, cents per oz.	70.00
Tin, Grade A, New York	$1.03
Zinc, East St. Louis	17.50
Zinc, New York	18.15
Zirconium copper, 10-12 pct Zr, per lb contained Zr	$12.00

Remelted Metals

Brass Ingot

(Published prices, cents per lb delivered, carloads)

85-5-5-5 ingot		
No. 115	21.00*	22.00
No. 120	20.50*	21.50
No. 123	20.00*	21.00
80-10-10 ingot		
No. 305	....	27.25
No. 315	....	24.25
88-10-2 ingot		
No. 210	....	33.00
No. 215	....	31.00
No. 245	24.75*	25.75
Yellow ingot		
No. 405	17.00*	17.50
Manganese bronze		
No. 421	....	23.00

* F.o.b. Philadelphia.

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	31.25–31.75
0.60 copper, max.	30.75–31.25
Piston alloys (No. 122 type)	26.50–27.00
No. 12 alum. (No. 2 grade)	26.25–26.75
108 alloy	26.50–27.00
195 alloy	27.00–27.25
13 alloy	31.00–31.50
AXS-679	27.25–27.75

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95 pct-95½ pct	28.75–29.50
Grade 2—92 pct-95 pct	27.75–28.50
Grade 3—90 pct-92 pct	26.75–27.50
Grade 4—85 pct-90 pct	26.25–26.75

Electroplating Supplies

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	40⅛
Electrodeposited	34⅝
Rolled, oval, straight, delivered	37.34
Ball anodes	38⅝
Brass, 80-20	
Cast, oval, 15 in. or longer	35⅞
Zinc, oval, 99.99	
Ball anodes	
Nickel 99 pct plus	
Cast	59.00
Rolled, depolarized	
Cadmium	$2.10
Silver 999 fine, rolled, 100 oz. lots, per troy oz, f.o.b. Bridgeport, Conn.	79

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	46.00
Copper sulfate, 99.5 crystals, bbls.	9.10
Nickel salts, single or double, 100 lb bags, frt. allowed	18.50
Nickel chloride, 300 lb bbl.	24.50
Silver cyanide, 100 oz. lots, per oz.	59
Sodium cyanide, 96 pct domestic 100 lb drums	16.00
Zinc sulfate, crystals, 22.5 pct, bags	
Zinc sulfate, 25 pct, granules, bbls. frt. allowed	

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 26.9¢; 4S, 61S-O, 28.8¢; 52S, 30.9¢; 24S-O, 24S-OAL, 29.8¢; 75S-O, 75S-OAL, 36.3¢; 0.081 in., 2S, 3S, 27.9¢; 4S, 61S-O, 30.2¢; 52S, 32.3¢; 24S-O, 24S-OAL, 30.9¢; 75S-O, 75S-OAL, 38¢; 0.032 in., 2S, 3S, 29.5¢; 4S, 61S-O, 33.5¢; 52S, 36.2¢; 24S-O, 24S-OAL, 37.9¢; 75S-O, 75S-OAL, 47.6¢.

Plate: ¼ in. and heavier: 2S, 3S, F, 23.8¢; 4S-F, 26¢; 52S-F, 27.1¢; 61S-O, 26.6¢; 24S-F, 24S-FAL, 27.1¢; 75S-F, 75S-FAL, 33.9¢.

Extruded Solid Shapes: Shape factors 1 to 4; 35.1¢ to 66¢; 11 to 13, 36.1¢ to 78¢; 23 to 25, 38.2¢ to $1.07; 35 to 37, 45.7¢ to $1.65; 47 to 49, 67.5¢ to $2.41.

Rod, Rolled: 1.064 to 4.5 in., 2S-F, 3S-F, 34¢ to 30.5¢; Cold-finished, 0.375 to 3.5 in., 2S, 3S, 36.5¢ to 32¢.

Screw Machine Stock: Drawn, ⅛ to 11/32 in., 11S-T3, R317-T4, 49¢ to 38¢; cold-finished, ⅜ to 1½ in., 11S-T3, 37.5¢ to 35.5¢; ⅜ to 2 in., R317-T4, 37.5¢ to 34.5¢; rolled, 1 9/16 to 3 in., 11S-T3, 35.5¢ to 32.5¢; 2⅛ to 3⅜ in., R317-T4, 33.5¢ to 32.5¢. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in.: 2S, 36¢ to 26.5¢; 52S, 44¢ to 32¢; 56S, 47¢ to 38.5¢; 17S-T4, 50¢ to 34.5¢; 61S-T4, 44.5¢ to 34¢; 75S-T6, 76¢ to 55¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed Base quantity 30,000 lb)

Sheet and Plate: Ma, FSa, ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-$1.01; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher.

Extruded Round Rod: M, diam. in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1¼ to 1.749, 43¢; 2½ to 5, 41¢. Other alloys higher.

Extruded Square, Hex. Bar: M, size across flats, in., ¼ to 0.311, 61¢; ½ to 0.749, 48¢; 1¼ to 1.749, 44¢; 2½ to 4, 42¢. Other alloys higher.

Extruded Solid Shapes, Rectangles: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb. per ft. per. up to 3.5 in., 55¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ to 5/16, $1.14; 5/16 to ⅜, $1.02; ½ to ⅝, 76¢; 1 to 2 in., 65¢. 0.065 to 0.082, ⅜ to 7/16, 85¢; ⅝ to ¾, 62¢; 1 to 2 in., 57¢. 0.165 to 0.219, ⅝ to ¾, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher.

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	60	47
Strip, cold-rolled	66	50
Rods and shapes		
Hot-rolled	56	45
Cold-drawn	56	45
Angles, hot-rolled	56	45
Plates	58	46
Seamless tubes	89	80
Shot and blocks	..	40

Copper, Brass, Bronze

(Cents per pound, freight prepaid on 200 lb)

	Extruded Shapes	Rods	Sheets
Copper	36.78	....	37.18
Copper, hot-rolled	....	33.03	....
Copper, drawn	....	34.28	....
Low brass	38.57*	35.35	35.66
Yellow brass	37.60*	34.28	34.59
Red brass	38.92*	35.70	36.01
Naval brass	34.90	33.65	39.59
Leaded brass	....	29.24	....
Commercial bronze	39.54*	36.57	36.88
Manganese bronze	38.49	36.99	43.09
Phosphor bronze, 5 pct	57.80*	56.30	56.05
Muntz metal	34.47	33.22	37.66
Everdur, Herculoy, Olympic, etc.	40.49	40.76	41.82
Nickel silver 10 pct	....	47.17	44.77
Architectural bronze	33.42	....	....

* Seamless tubing.

Scrap Metals

Brass Mill Scrap

(Cents per pound; add ½¢ per lb for shipments of 20,000 lb or more)

	Heavy	Turnings
Copper	21⅛	20⅝
Yellow brass	18⅞	18⅛
Red brass	20	19¼
Commercial bronze	20⅛	19⅝
Manganese bronze	18¾	17⅞
Leaded brass rod ends	18⅛	

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery.)

No. 1 copper wire	20.50–20.50
No. 2 copper wire	19.50–19.50
Light copper	18.50–18.50
Refinery brass	18.25–18.50

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer.)

No. 1 copper, wire	19.75
No. 2 copper, wire	18.75
Light copper	17.75
No. 1 composition	16.50–16.50
No. 1 comp. turnings	16.25–16.25
Rolled brass	12.75–13.25
Brass pipe	13.25–13.75
Radiators	14.00–14.50
Heavy yellow brass	12.50–12.75

Aluminum

Mixed old cast	16.00
Mixed old clips	16.00
Mixed turnings, dry	14.50
Pots and pans	16.50
Low copper	19.00

Dealers' Scrap

(Dealer's buying prices, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	18½—19
No. 2 heavy copper and wire	17½—18
Light copper	16½—17
Auto radiators (unsweated)	12 —12¼
No. 1 composition	14½—15
No. 1 composition turnings	14 —14½
Clean red car boxes	12 —12½
Cocks and faucets	12 —12½
Mixed heavy yellow brass	9 — 9½
Old rolled brass	11½—12
Brass pipe	13 —13½
New soft brass clippings	15 —15½
Brass rod ends	13 —13½
No. 1 brass rod turnings	12½—13

Aluminum

Alum. pistons and struts	8 — 8½
Aluminum crankcases	12 —12½
2S aluminum clippings	16 —16½
Old sheet & utensils	12 —12½
Borings and turnings	6 — 6½
Misc. cast aluminum	12 —12½
Dural clips (24S)	12 —12½

Zinc

New zinc clippings	11 —11½
Old zinc	9½—10
Zinc routings	5¼— 5¾
Old die cast scrap	6¼— 6¾

Nickel and Monel

Pure nickel clippings	22 —23
Clean nickel turnings	17 —18
Nickel anodes	22 —23
Nickel rod ends	21 —22
New Monel clippings	15½—16½
Clean Monel turnings	11 —12
Old sheet Monel	13 —14
Old Monel castings	10 —11
Inconel clippings	12 —13
Nickel silver clippings, mixed	8 — 8½
Nickel silver turnings, mixed	7 — 7½

Lead

Soft scrap lead	18 —18½
Battery plates (dry)	12 —12½

Magnesium Alloys

Segregated solids	8 — 9
Castings	4½— 5½

Miscellaneous

Block tin	82 —84
No. 1 pewter	65 —67
No. 1 auto babbitt	51 —53
Mixed common babbitt	19 —19½
Solder joints	21½—22½
Siphon tops	50 —52
Small foundry type	20½—21
Monotype	19½—20
Lino. and stereotype	19 —19½
Electrotype	17½—18
New type shell cuttings	15½—16
Hand picked type shells	6½— 7
Lino. and stereo dross	10½—11
Electro dross	7 — 7½

UNITED STATES STEEL SUPPLY COMPANY
USS
STEELS
SERVICE

A New Year's message to our friends

As a difficult year draws to a close we take this opportunity to express appreciation to our many customers for their business and for their patient understanding.

The unbelievable demand for steel created an almost insurmountable problem for the industry.

We tried to meet this situation to the best of our ability. New warehouses increased our facilities in 1948 and further improvements are planned for 1949. We are now at your service from coast to coast, determined to serve you better.

Meanwhile, let us extend our sincere best wishes for a happy holiday season and a successful New Year.

UNITED STATES STEEL SUPPLY COMPANY

BALTIMORE · BOSTON · CHICAGO · CLEVELAND · LOS ANGELES · MILWAUKEE
NEWARK · PITTSBURGH · ST. LOUIS · SAN FRANCISCO · TWIN CITY (St. Paul)

Holidays Bring Wait-And-See Attitude

New York

• • • **After the dip** in cast prices last week the market was generally quiet this week with the exception of the Chicago area. A heavy snow fall and the holiday period have set up much of a wait-and-see atmosphere with little further change seen until after the beginning of the year.

Dealer scrap fell off $2 in Chicago. Turning and boring price offers were lower with few sales being made there. One large consumer has withdrawn from the market until Jan. 1 and railroad scrap showed a further decline again this week. The dip in these grades, observers claim, is due to comfortable position of the mills and a drive to reduce year-end inventories. Railroad prices there appear poised for further decline.

Mixed yard cast took another dip in the Philadelphia market this week to go at $59 to $60 while the New York market fell off slightly for the first time.

Snow this week brought forth the first test for scrap movement. It was slowed down to a halt in some areas. But signs of better weather minimize the normal effects of such conditions.

The cast market generally has a very weak tone throughout all market areas. Little or no change in he condition is expected until after he New Year. In fact a terriffic est is expected at that time in the cast market because many of the big consumers are reported to have nventories that range into 3 to 4 months. This would take them well nto the Spring, a time at which normal movement of scrap will have been resumed.

•

PITTSBURGH—Any possibility of a general price softening has been buried nder a blanket of snow. Normally, heavy snow strengthens scrap prices but here are no signs of such a trend now because consumers inventories are genrally in fine shape. Bad weather has been late and stockpiles built up far bove their normal level for late Decemer. Further, the heavy proportion of crap moving direct from fabricator to mill reduces the flow through dealers and minimizes the effect of weather. Prices ere were unchanged during the past week. Dealers and brokers report new business in cast iron unobtainable at any price but demand from outside the district leaves local price quotations unchanged.

•

CHICAGO—Dealer scrap fell off $2 in Chicago last week. At present time turning and boring price offers were lower with only a few sales made. One local mill is buying dealers bundles at the lower price. Other mills are out of the market. Carnegie told THE IRON AGE they would buy no more scrap before Jan. 1. Offers of No. 2 heavy melting have been made at the lower price also. Railroad scrap showed further decline. The dip, observers claim, is due to comfortable mill position and the year end drive to lower inventories. Railroad specialties appear poised for further decline.

•

PHILADELPHIA—The 7 to 8 in. snowfall that fell over the weekend in this area, accompanied by some freezing temperatures, will have a retarding effect on yard operations. So far there has been no evidence that mills have been made anxious over scrap because of their present comfortable stocks. The foundry cast market is still weaker and there has been very little business to establish the market. Foundries were not buying, due to their declining backlogs and the fact that pig iron seems to be in greater supply. Low phos grades are difficult to move and a tonnage was moved at $49.50. Electric furnace users are largely out of market. Turnings are in short supply and the market is stronger. Caution is being shown in the bidding on railroad lists but there is no doubt that these grades will continue to demand premiums.

•

CLEVELAND—Bulk of the big consumers in this area are out of the market until the end of the year, and perhaps for a few weeks longer. The market here and in the Valley is quiet and stable, and indications are that it will not go below current levels, despite the shipments of the past few days, which one mill buyer described as "terrific." Buying is likely to become more selective. No. 2 bundles, for example, may follow the pattern of another district with a $2 drop in price. Cast grades are weaker, and material is being held back at present price levels. Shipments of all grades of scrap are likely to fall off during the next 6 weeks, but by the end of January mills will begin to anticipate spring shipments.

•

DETROIT—The Detroit scrap market continues on the soft side although this condition is not yet reflected pricewise in the market. The unusual situation in which machine shop turnings are temporarily selling above short shovel material, continues, although this situation is expected to change momentarily. There are also indications that cast iron scrap prices may slip to a lower level in the near future.

■

CINCINNATI—Trade sources anticipate no substantial change in the market here for the next week or so. Openhearth material continues in strong demand, with supply spotty. Cast grades are weaker, but whether this weakness is due to the holiday period or a clean-up of year-end inventories, or a bona fide decline in demand is the subject of considerable speculation. Quality tonnage is still bringing the price. The real test on cast will probably come from the south when, for example, Birmingham drops out. Shipments of openhearth and blast furnace material are good, but will probably fall off after the first of the year.

■

NEW YORK—Following a softness which has existed for several weeks, cast grades slipped in this market area this week. Mixed yard cast is down $1, going at $56 to $57, while heavy breakable and charging box cast dropped 50c to sell at $55.50 to $56.50. Only one of three large consumers of mixed yard cast is still taking any of that grade. Most of the large foundries are well fixed with supplies, some as well as 3 to 4 months. This is a bad time to indicate what the future in the cast market has in store for the future. But at present the market is definitely weak.

■

BUFFALO — Inventory-conscious scrap consumers took it easily last week and the market action slowed accordingly. Leading mills have good stocks in hand and relighting of a blast furnace helped improve the position of one interest. Two foundries held up shipments until after the holidays, contributing to further softness in cast grades, and a major consumer of low phos was out of the market with a 3-month stockpile. No. 1 heavy melting was variously listed as strong and easy, but prices held within the old range. Pennsylvania R. R. list omitted No. 1 railroad heavy melting, but in the last New York Central list it went at $50. The Central also offered some 5 foot by 18 inch stuff as low phos that brought the identical figure. More openhearth tonnage was reported coming from downstate points as Pittsburgh district interest lagged. Demand for blast furnace scrap at over-the-market prices seemed less urgent.

•

BOSTON—Over-the-market buyers who have been active here for many months, have made a mass withdrawal, and the latest prices indicate that No. 2 heavy melting steel, No. 1 and 2 bundles and bushelings are now commanding the single formula quotation of $34.40. No. 1 heavy melting still, on occasions, sells for as high as $38.90, but the market, according to brokers, is very dull and prices tend toward the weaker side. The spread on shoveling turnings increased somewhat from $31.40-$32.50 to $31-$33.50. Chemical borings are not being taken and cast is even harder to move.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	$42.50 to $43.00
RR. hvy. melting	43.50 to 44.00
No. 2 hvy. melting	42.50 to 43.00
RR. scrap rails	58.00 to 59.00
Rails 2 ft and under	62.00 to 62.50
No. 1 comp'd bundles	42.50 to 43.00
Hand bdld. new shts.	42.50 to 43.00
Hvy. axle turn.	45.50 to 46.50
Hvy. steel forge turn.	45.50 to 46.50
Mach. shop turn.	37.50 to 38.00
Shoveling turn.	39.00 to 40.00
Mixed bor. and turn.	37.50 to 38.00
Cast iron borings	39.50 to 40.00
No. 1 mach. cast	69.50 to 70.50
Mixed yard cast	64.00 to 65.00
Hvy. breakable cast	62.00 to 63.00
Malleable	76.00 to 77.00
RR. knuck. and cup.	57.00 to 58.00
RR. coil springs	57.00 to 58.00
RR. leaf springs	57.00 to 58.00
Rolled steel wheels	57.00 to 58.00
Low phos.	49.50 to 50.50

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$41.50 to $42.00
No. 2 hvy. melting	39.50 to 40.00
No. 1 bundles	41.50 to 42.00
No. 2 dealers' bundles	39.50 to 40.00
Bundled mach. shop turn.	39.50 to 40.00
Galv. bundles	37.00 to 38.00
Mach. shop turn.	35.50 to 36.00
Short shov. turn.	37.50 to 38.00
Cast iron borings	36.50 to 37.00
Mix. borings and turn.	35.50 to 36.00
Low phos. hvy. forge	51.00 to 52.00
Low phos. plates	49.00 to 50.00
No. 1 RR. hvy. melt.	44.25 to 48.00
Rerolling rails	69.00 to 70.00
Miscellaneous rails	62.00 to 64.00
Angles & splice bars	55.00 to 56.00
Locomotive tires, cut	52.00 to 53.00
Cut bolster & side frames	51.00 to 52.00
Standard stl. car axles	84.00 to 86.00
No. 3 steel wheels	49.00 to 50.00
Couplers and knuckles	50.00 to 51.00
Rails, 2 ft and under	58.00 to 59.00
Malleable	82.00 to 83.00
No. 1 mach. cast	68.00 to 69.00
No. 1 agricul. cast	60.00 to 62.00
Heavy breakable cast.	60.00 to 62.00
RR. grate bars	60.00 to 61.00
Cast iron brake shoes	59.00 to 60.00
Cast iron car wheels	64.00 to 65.00

CINCINNATI

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	$40.00 to $41.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 bundles	40.00 to 41.00
No. 2 bundles	40.00 to 41.00
Mach. shop turn.	35.00 to 36.00
Shoveling turn.	37.00 to 38.00
Cast iron borings	36.00 to 37.00
Mixed bor. & turn.	35.00 to 36.00
Low phos., 18 in. under	48.00 to 49.00
No. 1 cupola cast.	65.00 to 66.00
Hvy breakable cast	59.00 to 60.00
Rails 18 in. and under	61.00 to 63.00
Rails random length	56.00 to 57.00
Drop broken	69.00 to 70.00

BOSTON

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$37.00 to $38.90
No. 2 hvy. melting	34.40 to 34.40
Nos. 1 and 2 bundles	34.40 to 34.40
Bushelings	34.40 to 34.40
Shoveling turn.	31.00 to 33.50
Machine shop turn.	29.40 to 31.00
Mixed bor. and turn.	29.40 to 31.00
Cl'n cast chem. bor.	nominal
No. 1 machinery cast.	64.00 to 65.00
No. 2 machinery cast.	57.00 to 59.00
Heavy breakable cast.	52.50
Stove plate	54.50 to 55.50

DETROIT

Per gross ton, brokers' buying prices f.o.b. cars:

No. 1 hvy. melting	$38.00
No. 2 hvy. melting	38.00
No. 1 bundles	38.00
New busheling	38.00
Flashings	38.00
Mach. shop turn.	$32.50 to 33.00
Machinery cast	61.00 to 63.00
Mixed yard cast	57.00 to 58.00
Shoveling turn.	31.50 to 32.00
Cast iron borings	32.50 to 33.00
Mixed bor. & turn.	31.50 to 32.00
Low phos. plate	42.50 to 43.00
Heavy breakable cast.	53.00 to 57.00
Stove plate	57.00 to 58.00
Automotive cast.	64.00 to 66.00

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	$44.00 to $45.00
No. 2 hvy. melting	41.00 to 41.50
No. 1 bundles	44.00 to 45.00
No. 2 bundles	41.00 to 41.50
Mach. shop turn.	37.00 to 38.00
Shoveling turn.	41.00 to 41.50
Mixed bor. and turn.	36.75 to 37.25
Clean cast chemical bor.	nominal
No. 1 machinery cast.	65.00 to 66.00
No. 1 mixed yard cast.	59.00 to 60.00
Hvy. breakable cast.	61.00 to 62.00
Hvy. axle forge turn.	46.00 to 47.00
Low phos. acid, openhearth	48.50 to 49.50
Low phos., electric furnace	50.00 to 51.00
Low phos. bundles	46.00 to 47.00
RR. steel wheels	54.00 to 55.00
RR. coil springs	54.00 to 55.00
RR. malleable	80.00 to 82.00
Cast iron carwheels	68.00 to 70.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	$44.00 to $45.00
No. 2 hvy. melting	40.00 to 41.00
Bundled sheets	40.00 to 41.00
Mach. shop turn.	35.00 to 36.00
Shoveling turnings	37.00 to 38.00
Locomotive tires, uncut	47.00 to 48.00
Mis. std. sec. rails	57.00 to 58.00
Steel angle bars	55.00 to 57.00
Rails 3 ft and under	60.00 to 62.00
RR. steel springs	49.00 to 50.00
Steel car axles	73.00 to 75.00
Brake shoes	56.00 to 57.00
Malleable	77.00 to 78.00
Cast iron car wheels	65.00 to 66.00
No. 1 machinery cast.	66.00 to 67.00
Hvy. breakable cast.	60.00 to 61.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.00
No. 2 hvy. melting	40.00
No. 2 bundles	40.00
No. 1 bunsheling	40.00
Long turnings	$32.00 to 33.00
Shoveling turnings	35.00 to 36.00
Cast iron borings	29.50
Bar crops and plate	44.00 to 45.00
Structural and plate	44.00 to 45.00
No. 1 cupola cast.	71.00 to 73.00
Stove plate	65.00 to 67.00
No. 1 RR. hvy. melt.	41.00
Steel axles	51.00 to 52.00
Scrap rails	44.00 to 45.00
Rerolling rails	65.00 to 67.00
Angles & splice bars	53.00 to 54.00
Rails 3 ft & under	53.00 to 54.00
Cast iron carwheels	63.00 to 64.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	$42.50 to $43.00
No. 2 hvy. melting	42.50 to 43.00
Mach. shop turn.	37.50 to 38.00
Short shov. turn.	39.00 to 40.00
Cast iron borings	38.00 to 39.00
Low phos.	47.50 to 48.00

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$38.50 to $39.00
No. 2 hvy. melting	37.00
No. 2 bundles	37.00
Mach. shop turn.	31.50 to 32.00
Mixed bor. & turn.	31.50 to 32.00
Shoveling turnings	33.50 to 34.00
Machinery cast.	59.00 to 60.00
Mixed yard cast	56.00 to 57.00
Heavy breakable cast.	55.50 to 56.50
Charging box cast.	55.50 to 56.50
Unstrp. motor blks.	53.50 to 54.50
Cl'n cast chem. bor.	nominal

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$47.00 to $49.00
No. 2 hvy. melting	41.75 to 42.25
No. 1 bundles	41.75 to 42.25
No. 2 bundles	41.75 to 42.25
No. 1 busheling	41.75 to 42.25
Mach. shop turn.	36.75 to 37.25
Shoveling turn.	38.75 to 39.25
Cast iron borings	37.75 to 38.25
Mixed bor. and turn.	36.75 to 37.25
Clean auto. cast.	67.00 to 69.00
Mixed yard cast.	63.00 to 66.00
Stove plate	63.00 to 66.00
RR. malleable	70.00 to 75.00
Small indus. malleable	47.00 to 49.00
Low phos. plate	48.00 to 50.00
Scrap rails	58.00
Rails 3 ft & under	63.00 to 64.00
RR. steel wheels	56.00 to 58.00
RR. coil & leaf spgs.	56.00 to 58.00
RR. knuckles & coup.	56.00 to 58.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	$42.00 to $42.50
No. 2 hvy. melting	42.00 to 42.50
No. 1 bundles	42.00 to 42.50
No. 1 busheling	42.00 to 42.50
Drop forge flashings	42.00 to 42.50
Mach. shop turn.	37.00 to 37.50
Shoveling turn.	38.50 to 39.50
Steel axle turn.	42.00 to 42.50
Cast iron borings	37.50 to 38.50
Mixed bor. & turn.	36.50 to 37.50
Low phos. 2 ft and under	47.00 to 47.50
No. 1 machinery cast.	72.00 to 74.00
Malleable	79.00 to 81.00
RR. cast.	75.50 to 77.00
Railroad grate bars	58.00 to 61.00
Stove plate	61.00 to 63.00
RR. hvy. melting	43.00 to 43.50
Rails 3 ft and under	63.50 to 64.50
Rails 18 in. and under	65.00 to 66.00

SAN FRANCISCO

Per gross ton, f.o.b. shipping point:

No. 1 hvy. melting	$27.50
No. 2 hvy. melting	27.50
No. 2 bales	27.50
No. 3 bales	24.50
Mach. shop turn.	18.00
Elec. fur. 1 ft under	$40.00 to 42.00
No. 1 cupola cast.	58.00 to 60.00
RR. hvy. melting	28.50
Rails	29.00

LOS ANGELES

Per gross ton, f.o.b. shipping point:

No. 1 hvy. melting	$27.50
No. 2 hvy. melting	27.50
No. 1 bales	27.50
No. 2 bales	27.50
No. 3 bales	24.50
Mach. shop turn.	20.00
Elec. fur. 1 ft under	$40.00 to 42.00
No. 1 cupola cast.	40.00 to 50.00
RR. hvy. melting	28.50

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melt.	$30.00 to $33.00
Elec. fur. 1 ft and under	40.00 to 42.00
No. 1 cupola cast.	50.00 to 54.00
RR. hvy. melting	30.00 to 38.00

HAMILTON, ONT.

Per gross ton delivered to consumer:
Cast grades f.o.b. shipping point:

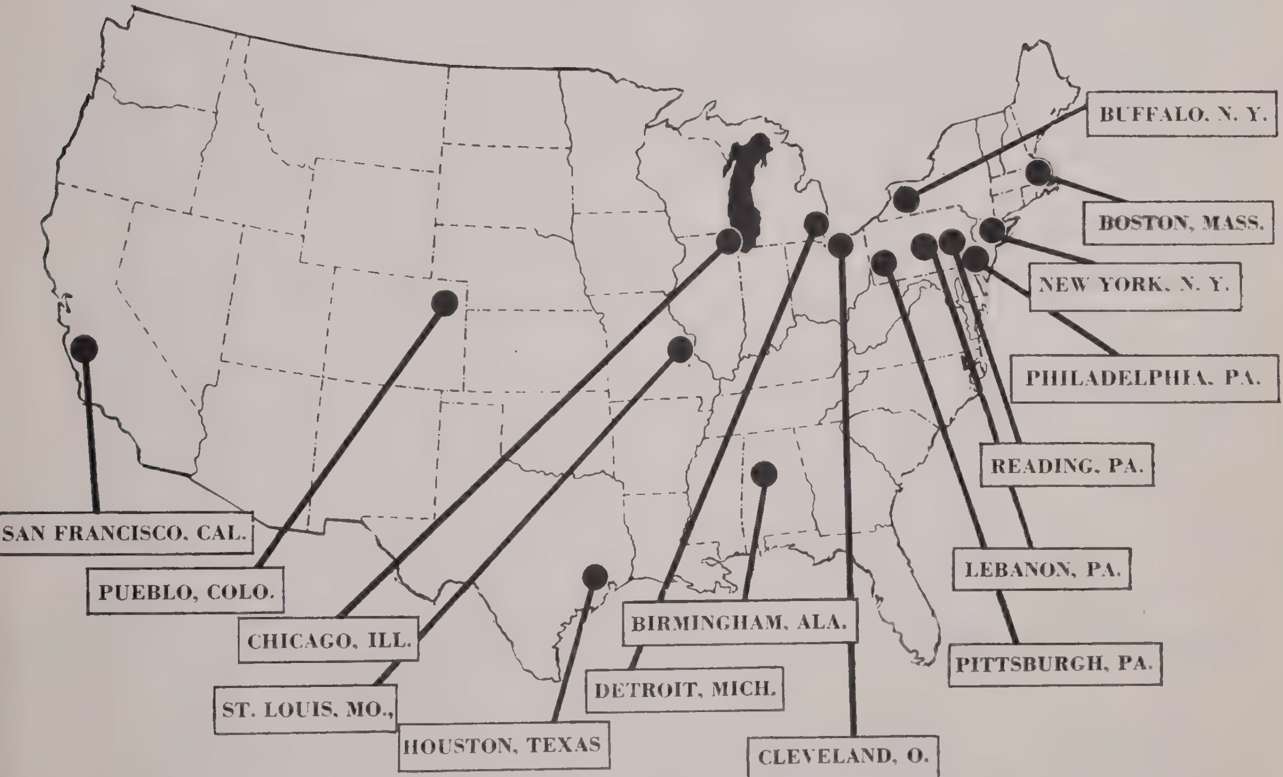
Heavy melting	$23.00*
No. 1 bundles	23.00*
No. 2 bundles	22.50*
Mechanical bundles	21.00*
Mixed steel scrap	19.00*
Mixed borings and turnings	17.00*
Rails, remelting	23.00*
Rails, rerolling	26.00*
Bushelings	17.50*
Bushelings, new fact, prop'd	21.00*
Bushelings, new fact, unprop'd	16.00*
Short steel turnings	17.00*
No. 1 cast	$48.00 to 50.00*
No. 2 cast	44.00 to 46.00*

*Ceiling Price

For the Purchase or Sale of

Iron and Steel Scrap . . .

CONSULT OUR NEAREST OFFICE


BUFFALO, N. Y.
BOSTON, MASS.
NEW YORK, N. Y.
PHILADELPHIA, PA.
READING, PA.
LEBANON, PA.
PITTSBURGH, PA.
SAN FRANCISCO, CAL.
PUEBLO, COLO.
CHICAGO, ILL.
ST. LOUIS, MO.,
HOUSTON, TEXAS
BIRMINGHAM, ALA.
DETROIT, MICH.
CLEVELAND, O.

The energy and integrity of our organization is ready to serve your best interests . . . Since 1889, Luria Bros. & Company, Inc. have made fair dealings their constant aim.

LURIA BROTHERS AND COMPANY, INC.

Main Office

LINCOLN-LIBERTY BLDG.
Philadelphia 7, Pennsylvania

Yards

LEBANON, PA. • READING, PA.
DETROIT (ECORSE), MICH.
MODENA, PA. • PITTSBURGH, PA.

Branch Offices

BIRMINGHAM, ALA.
Empire Bldg.
BOSTON, MASS.
Statler Bldg.
BUFFALO, N. Y.
Genesee Bldg.
CHICAGO, ILL.
100 W. Monroe St.
CLEVELAND, O.
1022 Midland Bldg.
DETROIT, MICH.
2011 Book Bldg.
HOUSTON, TEXAS
Cotton Exchange
LEBANON, PA.
Luria Bldg.
NEW YORK, N. Y.
Woolworth Bldg.
PITTSBURGH, PA.
Oliver Bldg.
PUEBLO, COLO.
Colorado Bldg.
READING, PA.
Luria Bldg.
ST. LOUIS, MO.
2110 Railway Exchange Bldg.
SAN FRANCISCO, CAL.
Pacific Gas & Elec. Co., Bldg.

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices . .

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	Dec. 21, 1948	Dec. 14, 1948	Nov. 23, 1948	Dec. 23, 1947
Hot-rolled sheets	3.26	3.26	3.26	2.80
Cold-rolled sheets	4.00	4.00	4.00	3.55
Galvanized sheets (10 ga)	4.40	4.40	4.40	3.95
Hot-rolled strip	3.265	3.265	3.265	2.80
Cold-rolled strip	4.063	4.063	4.063	3.55
Plates	3.42	3.42	3.42	2.95
Plates wrought iron	7.85	7.85	7.85	6.85
Stains C-R strip (No. 302)	33.25	33.25	33.25	30.50
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes	$6.80	$6.80	$6.80	$5.75
Tinplate, electro (0.50 lb)	6.00	6.00	6.00	5.05
Special coated mfg. ternes	5.90	5.90	5.90	4.90
Bars and Shapes: (cents per pound)				
Merchant bars	3.37	3.37	3.37	2.90
Cold-finished bars	3.995	3.995	3.995	3.55
Alloy bars	3.75	3.75	3.75	3.30
Structural shapes	3.25	3.25	3.25	2.80
Stainless bars (No. 302)	28.50	28.50	28.50	26.00
Wrought iron bars	9.50	9.50	9.50	7.15
Wire: (cents per pound)				
Bright wire	4.256	4.256	4.256	3.55
Rails: (dollars per 100 lb)				
Heavy rails	$3.20	$3.20	$3.20	$2.75
Light rails	3.55	3.55	3.55	3.10
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$52.00	$52.00	$52.00	$45.00†
Slabs, rerolling	52.00	52.00	52.00	45.00†
Forging billets	61.00	61.00	61.00	55.00†
Alloy blooms, billets, slabs	63.00	63.00	63.00	66.00†
Wire rod and Skelp: (cents per pound)				
Wire rods	3.619	3.619	3.619	2.80
Skelp	3.25	3.25	3.25	2.60

† Gross ton

Pig Iron: (per gross ton)	Dec. 21, 1948	Dec. 14, 1948	Nov. 23, 1948	Dec. 23, 1947
No. 2, foundry, Phila.	$51.56	$51.56	$51.56	$40.97
No. 2, Valley furnace	46.50	46.50	46.50	36.50
No. 2, Southern Cin'ti	49.47	49.47	49.47	40.24
No. 2, Birmingham	43.38	43.38	43.38	34.88
No. 2, foundry, Chicago†	46.00	46.00	46.00	36.00
Basic del'd Philadelphia	50.76	50.76	50.76	40.47
Basic, Valley furnace	46.00	46.00	46.00	36.00
Malleable, Chicago†	46.50	46.50	46.50	36.50
Malleable, Valley	46.50	46.50	46.50	36.50
Charcoal, Chicago	73.78	73.78	73.78	56.04
Ferromanganese‡	161.71	161.71	161.71	145.00

† The switching charge for delivery to foundries in the Chicago district is $1 per ton.

‡ Average of U. S. prices quoted on Ferroalloy page.

Scrap (per gross ton)				
Heavy melt'g steel, P'gh.	$42.75	$42.75	$42.75	$40.00
Heavy melt'g steel, Phila.	44.50	44.50	44.50	40.50
Heavy melt'g steel, Ch'go	41.75	41.75	41.75	38.75
No. 1, hy. comp. sh't, Det.	38.00	38.00	38.00	34.75
Low phos. Young'n	47.75	47.75	47.75	47.25
No. 1, cast, Pittsburgh	70.00	70.00	70.00	54.50
No. 1, cast, Philadelphia	65.50	65.50	66.50	55.50
No. 1, cast, Chicago	*68.50*	70.00	72.50	63.50
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$15.00	$15.00	$15.00	$12.50
Foundry coke, prompt	17.00	17.00	17.00	14.00
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	23.50	23.50	23.50	21.50
Copper, Lake Conn.	23.625	23.625	23.625	21.625
Tin, Grade A, New York	$1.03	$1.03	$1.03	94.00
Zinc, East St. Louis	17.50	17.50	17.50	10.50
Lead, St. Louis	21.30	21.30	21.30	14.80
Aluminum, virgin	17.00	17.00	17.00	15.00
Nickel, electrolytic	42.90	42.90	42.90	37.67
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	38.50	38.50	38.50	33.00

Composite Prices . .

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942, and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when shipments for this quarter are compiled.

	FINISHED STEEL (Base Price)	PIG IRON	SCRAP STEEL
Dec. 21, 1948	3.75628¢ per lb.	$46.82 per gross ton	$43.00 per gross ton
One week ago	3.75628¢ per lb.	$46.82 per gross ton	$43.00 per gross ton
One month ago	3.75628¢ per lb.	$46.82 per gross ton	$43.00 per gross ton
One year ago	3.19541¢ per lb.	$37.06 per gross ton	$39.75 per gross ton

	HIGH	LOW	HIGH	LOW	HIGH	LOW
1948	3.75700¢ July 27	3.22566¢ Jan. 1	$46.82 Oct. 12	$39.58 Jan. 6	$43.16 July 27	$39.75 Mar. 9
1947	3.19541¢ Oct. 7	2.87118¢ Jan. 7	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
1946	2.83599¢ Dec. 31	2.54490¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.44104¢ Oct. 2	2.54490¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.29176¢	2.29176¢	23.61	23.61	$19.17	$19.17
1942	2.28249¢	2.28249¢	23.61	23.61	19.17	19.17
1941	2.43078¢	2.43078¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1934	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25
1933	1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3
1932	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1931	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29
1930	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. producing points in cents per pound unless otherwise indicated. Extras apply. (1) Commercial quality sheet grade; prices, 0.25¢ above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Cokes, 1.25 lb, deduct 20¢ per base box. (6) 18 gage and heavier. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 40,000 lb and over. (9) Carload lot in manufacturing trade. (10) Hollowware enameling, gages 29 to 31 only. (11) Produced to dimensional tolerances in AISI Manual Sec. 6. (12) Slab prices subject to negotiation in most cases. (13) San Francisco only. (14) Los Angeles only. (15) San Francisco and Los Angeles only. (16) Seattle only. (17) Seattle and Los Angeles only.

PRODUCTS	Base prices at producing points apply to the sizes and grades produced in these areas														
	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio		Detroit	Johnstown	Seattle, S. Frisco, LosAngeles	Fontana
INGOTS Carbon forging	$50.00														
Alloy	$51.00						(per net ton)								
BILLETS, BLOOMS, SLABS Carbon, rerolling[12]	$52.00				$52.00	$52.00	(per net ton)						$52.00		
Carbon forging billets	$61.00	$61.00	$61.00	$61.00	$61.00	$81.00	(per net ton)						$61.00		
Alloy	$63.00	$63.00				$63.00	(Bethlehem, Canton, Massillon = $63.00) (per net ton)								
PIPE SKELP	3.25						3.25				Warren =3.25				
WIRE RODS	3.40 to 4.15	3.40 to 3.90		3.40	3.40		3.65	3.50			Worcester 3.70		3.40	4.05[13] 4.10[14]	
SHEETS Hot-rolled[6]	3.25 to 3.30	3.25	3.25	3.25-3.30	3.25	3.25	3.25	3.25		Warren, Ashland =3.25		3.45		3.95[15]	5.65
Cold-rolled[1]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.70	4.00	Warren 4.00	4.20		Pittsburg, Cal. 4.95	
Galvanized (10 gage)	4.40	4.40	4.40		4.40			4.40	Canton =4.40	4.40	Ashland =4.40			5.15[15]	
Enameling (12 gage)	4.40	4.40	4.40	4.40			4.40		4.60	4.40		4.70			
Long ternes[2] (10 gage)	4.80		4.80							4.80					
STRIP Hot-rolled[3]	3.25 to 3.30	3.25 to 3.30	3.25	3.25 to 3.30	3.25	3.25	3.25	3.25		3.25	Warren =3.25	3.45		4.00 to 4.25	5.90
Cold-rolled[4]	4.00	4.25		4.00	4.00	4.00	4.00	4.00		New Haven 4.50 Warren=4.00 to 4.25		4.20 to 4.50			7.10
TINPLATE Cokes, 1.50 lb.[5] base box	$6.80	$6.80	$6.80		$6.90			$6.90	$7.00	Warren, Ohio =$6.80				Pittsburg, Cal.=$7.55	
Electrolytic 0.25, 0.50, 0.75 lb. box	Deduct $1.00, 80¢ and 60¢ respectively from 1.50 lb. coke base box price														
TERNES MFG., special coated	Deduct 90¢ from 1.50 lb. coke base box price														
BLACKPLATE CANMAKING 55-70 lb, 75-95 lb, 100-128 lb	Deduct $1.60, $1.70 and $1.60 respectively from 1.50 lb. coke base box price														
BLACKPLATE, h.e., 29 ga.[10]	4.75	4.75	4.75					4.85							
BARS Carbon Steel	3.35 to 3.55	3.35	3.35	3.35	3.35	3.35	3.35	3.35		3.35	Canton =3.35	3.55	3.35	4.05 to 4.10	5.30
Reinforcing (billet)[7]	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35			Canton =3.35		3.35	4.05 to 4.10	5.30
Cold-finished[8]	3.95 to 4.00	4.00	4.00	4.00		4.00	4.00					4.30			
Alloy, hot-rolled	3.75	3.75	3.75			3.75	3.75	Bethlehem, Canton, Massillon=3.75				4.05	3.75	4.80[14]	5.50
Alloy cold-drawn	4.65 to 4.75	4.65	4.65	4.65		4.65	4.65	Massillon=4.65			Worcester 4.95				
PLATE Carbon steel[11]	3.40 to 3.60	3.40	3.40	3.40 to 3.60	3.40 Conshohocken=3.95	3.45	3.40	3.45	Coatesville=3.75, Claymont=3.95 Geneva=3.40, Harrisburg=6.50			3.65	3.45	4.30[16]	5.80
Floor plates	4.55	4.55		4.55				Conshohocken=4.55							
Alloy	4.40	4.40							Coatesville=5.10						
SHAPES, Structural	3.25 to 3.30	3.25	3.25		3.25	3.30	Bethlehem=3.30, Geneva, Utah=3.25						3.30	3.85 to 4.30	5.75
MANUFACTURERS' WIRE[9] Bright	4.15 to 4.50	4.15 to 4.65		4.15	4.15		4.15	4.25	Duluth=4.15, Worcester=4.45				4.15	5.15[13]	
Spring (high carbon)	5.20	5.20		5.20				5.30	Worcester=5.50 New Haven, Trenton=5.50				5.20	Duluth = 5.20-6.15	
PILING, Steel sheet	4.05	4.05				4.05									

STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

	Chromium Nickel						Straight Chromium		
Product	301	302	303	304	316	347	410	416	430
Ingots, rerolling	12.75	13.50	15.00	14.50	22.75	20.00	11.25	13.75	11.50
Slabs, billets, rerolling	17.00	18.25	20.25	19.25	30.25	26.75	15.00	18.50	15.25
Forging discs, die blocks, rings	30.50	30.50	33.00	32.00	45.00	41.00	24.50	25.00	25.00
Billets, forging	24.25– 26.50	24.25– 26.50	26.25– 28.75	25.50– 27.75	39.00– 42.75	32.75– 35.75	19.50– 21.50	20.00– 21.75	20.00– 21.75
Bars, wire, structurals	28.50	28.50	31.00	30.00	46.00	38.50	23.00	23.50	23.50
Plates	32.00	32.00	34.00	34.00	50.50	44.00	26.00	26.50	26.50
Sheets	37.50– 40.75	37.50– 40.75	39.50– 43.00	39.50– 43.00	53.00– 57.25	50.00– 54.00	33.00	33.50	35.50 .....
Strip, hot-rolled	24.25	25.75	30.00	27.75	46.00	38.75	21.25	28.00	21.75
Strip, cold-rolled	30.50– 30.75	33.00– 33.50	36.50– 39.50	35.00– 35.75	55.00– 57.25	48.50– 50.00	27.00	33.50	27.50 .....

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unboxed

Diameter in in.	Length in in.	
Graphite		
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2½	24, 30	21.00¢
2	24, 30	23.00¢
Carbon		
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
17 to 20	84, 90	7.50¢
14	60, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	90.5¢
18	4	1	—	5	$1.42
18	4	2	—	—	$1.025
1.5	4	1.5	8	—	65¢
6	4	2	6	—	69.5¢

High-carbon-chromium	52¢
Oil harden manganese	29¢
Special carbon	26.5¢
Extra carbon	22¢
Regular carbon	19¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 4½¢ higher.

ELECTRICAL SHEETS

Base, HR cut lengths, f.o.b. mill

	Cents per lb
Armature	5.45
Electrical	5.95
Motor	6.70 to 9.20
Dynamo	7.50 to 10.00
Transformer 72	8.05 to 11.80
Transformer 65	8.60 to 12.35
Transformer 58	9.30 to 13.05
Transformer 52	10.10

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb	$3.20†
Joint bars, 100 lb	4.25
Light rails (from billets) per 100 lb	3.55

	Base Price cents per lb
Track spikes	5.35
Axles	5.20
Screw spikes	8.00
Tie plates	4.05
Tie plates, Pittsburg, Calif.*	4.20
Track bolts, untreated	8.25
Track bolts, heat treated, to railroads	8.50

*Seattle, add 30¢.

†CF&I and Inland, $3.50.

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.00¢
0.41 to 0.60 carbon	5.50¢
0.61 to 0.80 carbon	6.10¢
0.81 to 1.05 carbon	8.05¢
1.06 to 1.35 carbon	10.35¢

Worcester, add 0.30¢.

CLAD STEEL

Base prices, cents per pound

Stainless clad	Plate	Sheet
No. 304, 20 pct, f.o.b.		
Coatesville, Pa.	*26.50	
Washington, Pa.	*26.50	*22.50
Claymont, Del.	*26.50	
Conshohocken, Pa.		*22.50
Nickel-clad		
10 pct f.o.b. Coatesville, Pa.	27.50	
Inconel-clad		
10 pct, f.o.b. Coatesville.	36.00	
Monel-clad		
10 pct, f.o.b. Coatesville.	29.00	
Alumnized steel sheets		
Hot dip, 20 gage, f.o.b. Butler, Pa.	....	9.25

---

* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base Column	*Pittsburg, Calif.*
Standard & coated nails*	103	123
Galvanized nails*	103	123
Woven wire fence†	109	132
Fence posts, carloads††	114	...
Single loop bale ties	106	130
Galvanized barbed wire**	123	143
Twisted barbless wire	123	...

---

* Pgh., Chi., Duluth; Worcester, 6 columns higher. † 15½ gage and heavier. ** On 80 rod spools, in carloads. †† Duluth only.

	Base per 100 lb	*Pittsburg, Calif.*
Annealed fence wire‡	$4.80	$5.75
Annealed, galv. fencing‡	5.25	6.20
Cut nails, carloads‡‡	6.75	....

---

‡ Add 30¢ at Worcester; 10¢ at Sparrows Pt.

‡‡ Less 20¢ to jobbers.

HIGH STRENGTH, LOW ALLOY STEELS

Mill base prices, cents per pound

Steel	Aldecor	Corten	Double Strength No. 1	Dyn-alloy	Hi Steel	Mayari R	Otis-coloy	Yoloy	NAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Steel
Plates	5.20	5.20	5.20	5.30	5.20	5.30	5.20	5.20	5.65
Sheets									
Hot-rolled	4.95	4.95	4.95	5.25	4.95	4.95	4.95	4.95	5.25
Cold-rolled	6.05	6.05	6.05	....	6.05	6.05	6.05	6.05	6.35
Galvanized	....	6.75	....	....	....	6.75	....	....	....
Strip									
Hot-rolled	4.95	4.95	4.95	....	4.95	4.95	4.95	4.95	5.25
Cold-rolled	....	....	6.05	....	....	6.05	6.05	....	6.35
Shapes	....	4.95	....	....	4.95	5.05	4.95	....	....
Beams	....	4.95	....	....	....	....	....	....	....
Bars									
Hot-rolled	5.10	5.10	5.10	....	5.10	5.10	5.10	....	5.40
Bar shapes	....	5.10	....	....	5.10	5.10	5.10	....	....

PIPE AND TUBING

Base discounts, f.o.b. mills,
Base price, $200.00 per net ton.

STANDARD, THREADED AND COUPLED

Steel, buttweld	*Black*	*Galv.*
½-in.	43 to 41	20 to 18
¾-in.	46 to 44	24 to 22
1-in.	48½ to 46½	27 to 25
1¼-in.	49 to 47	27½ to 25½
1½-in.	49½ to 47½	28 to 26
2-in.	50 to 48	28½ to 26½
2½ to 3-in.	50½ to 49½	29 to 27
Steel, lapweld		
2-in.	39½	17½
2½ to 3 in.	39½	21½
3½ to 6 in.	46½ to 42	20½ to 24½
Steel, seamless		
2-in.	38½ to 27	16½ to 5
2½ to 3-in	41½ to 35	19½ to 10½
3½ to 6-in.	43½ to 38½	21½ to 16½
Wrought Iron, buttweld		
½-in.	+20½	+52½
¾-in.	+10½	+41½
1 & 1¼-in.	+ 4½	+32½
2-in.	— 1½	+29
3-in.	— 2	+28½
Wrought Iron, lapweld		
2-in.	+ 7½	+36½
2½ to 3½-in.	+ 5	+32
4-in.	list	+26
4½ to 8-in.	+ 2	+27½

EXTRA STRONG, PLAIN ENDS

Steel, buttweld		
½-in.	42 to 40	20½ to 18½
¾-in.	46 to 44	24½ to 22½
1-in.	48 to 46	27½ to 25½
1¼-in.	48½ to 46½	28 to 26
1½-in.	49 to 47	28½ to 26½
2-in.	49½ to 47½	29 to 27
2½ to 3-in.	50 to 48	29½ to 27½
Steel, lapweld		
2-in.	39½	18½
2½ to 3-in.	44½	23½
3½ to 6-in.	48 to 44	23 to 27
Steel, seamless		
2-in.	37½ to 32½	16½ to 11½
2½ to 3-in.	41½ to 36½	20½ to 15½
3½ to 6-in.	45	24
Wrought Iron, buttweld		
½-in.	+16	+46½
¾-in.	+ 9½	+39½
1 to 2-in.	— 1½	+28½
Wrought Iron, lapweld		
2-in.	+ 4½	+33
2½ to 4-in.	— 5	+21½
4½ to 6-in.	— 1	+26

For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut length 4 to 24 ft inclusive.

OD	Gage	Seamless		Electric Weld	
in in.	BWG	H.R.	C.R.	H.R.	C.D.
2	13	19.18	22.56	18.60	21.89
2½	12	25.79	30.33	25.02	29.41
3	12	28.68	33.76	27.82	32.74
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78

CAST IRON WATER PIPE

	Per net ton
6 to 24-in., del'd Chicago	$106.70
6 to 24-in., del'd N. Y.	103.50 to 108.40
6 to 24-in., Birmingham	93.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	120.30

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts

	Pct Off List
½ in. & smaller x 6 in. & shorter	35
9/16 & ⅝ in. x 6 in. & shorter	37
¾ in. & larger x 6 in. & shorter	34
All diam, longer than 6 in.	30
Lag, all diam over 6 in. longer	35
Lag, all diam x 6 in. & shorter	37
Plow bolts	47

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller	35
9/16 to 1 in. inclusive	34
1⅛ to 1½ in. inclusive	32
1⅝ in. and larger	27

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifinished Hexagon Nuts

	USS	SAE
7/16 in. and smaller	..	41
½ in. and smaller	38	..
½ in. through 1 in.	..	39
9/16 in. through 1 in.	37	..
1⅛ in. through 1½ in.	35	37
1⅝ in. and larger	28	..

In full case lots, 15 pct additional discount.

Stove Bolts

Packages, nuts separate	$61.75
In bulk	70.00

Large Rivets

	(½ in. and larger) *Base per 100 lb*
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	$6.75
F.o.b. Lebanon, Pa.	6.75

Small Rivets

	(7/16 in. and smaller) *Pct off List*
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	48

Cap and Set Screws

(In packages)	*Pct Off List*
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	46
¾ to 1 in. x 6 in., SAE (1035), heat treated	35
Set screws, oval points	
Milled studs	19
Flat head cap screws, listed sizes	5
Fillister head cap, listed sizes	28

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill.

Effective CaF, Content:	*Base price per net ton*
70% or more	$37.00
60% or less	34.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, Bessemer	$6.60
Old range, nonbessemer	6.45
Mesabi, bessemer	6.35
Mesabi, nonbessemer	6.20
High phosphorus	6.20

Increases or decreases in freight rates, dock handling charges and taxes after Apr. 1, 1948, are to be added to above prices.

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags	7.9¢ to 9.0¢
Domestic sponge iron, 98+% Fe, carload lots	9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+% Fe	19.5¢ to 39.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 microns, 98%, 99.8%+ Fe	90.0¢ to $1.75
Aluminum	30.00¢
Antimony	51.17¢
Brass, 10 ton lots	27.25 to 37.25¢
Copper, electrolytic	33.625¢
Copper, reduced	34.25¢
Cadmium	$2.55
Chromium, electrolytic, 99% min.	$3.50
Lead	27.80¢
Manganese	55.00¢
Molybdenum, 99%	$2.65
Nickel, unannealed	66.00¢
Nickel, spherical, minus 30 mesh, unannealed	68.00¢
Silicon	34.00¢
Solder powder	8.5¢ plus metal cost
Stainless steel, 302	75.0¢
Tin	$1.155
Tungsten, 99%	$2.90
Zinc, 10 ton lots	17.75 to 22.25¢

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$14.50 to $15.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$16.00 to $18.00
Foundry, Byproduct	
Buffalo	$22.75 to $23.10
Chicago, del'd	23.90
Chicago, f.o.b.	20.85
Detroit, f.o.b.	19.40
New England, del'd	22.75
Seaboard, N. J., f.o.b.	21.50
Philadelphia, f.o.b.	20.55
Swedeland, Pa., f.o.b.	20.50
Painesville, Ohio, f.o.b.	20.90
Erie, del'd	19.95
Cleveland, del'd	22.45
Cincinnati, del'd	21.40
St. Paul, del'd	23.17
St. Louis, del'd	20.98
Birmingham, del'd	18.66

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick	*Carloads, Per* 1000
First quality, Pa., Md., Ky., Mo. (except Salina, Pa., add $5)	$80.00
No. 1 Ohio	74.00
Sec. quality, Pa., Md., Ky., Mo.	74.00
No. 2 Ohio	66.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	11.50
Silica Brick	
Mt. Union, Pa., Ensley, Ala.	$80.00
Childs, Pa.	84.00
Hays, Pa.	85.00
Chicago District	89.00
Western, Utah and Calif.	95.00
Super Duty, Hays, Pa., Athens, Tex.	85.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	$13.75 to 14.00
Silica cement, net ton, bulk, Hays, Pa.	16.00
Silica cement, net ton, bulk, Ensley, Ala.	15.00
Silica cement, net ton, bulk, Chicago District	14.75
Silica cement, net ton, bulk, Utah and Calif.	21.00
Chrome Brick	*Per Net Ton*
Standard chemically bonded, Balt., Chester	$69.00
Magnesite Brick	
Standard, Balt. and Chester	$91.00
Chemically bonded, Balt. and Chester	80.00
Grain Magnesite	*Std. ⅝-in. grains*
Domestic, f.o.b. Balt. and Chester, in bulk, fines removed	$56.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines	$30.50 to 31.00
in sacks with fines	35.00 to 35.50
Dead Burned Dolomite	
F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk. Midwest, add 10¢; Missouri Valley, add 20¢	$12.25

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, per 100 lb.
(Metropolitan area delivery, add 15¢ to base, except New York, add 20¢)

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia	$5.15-5.71	$6.31-6.57	$7.27-7.52	$5.35-5.66	$6.51	$5.37-5.52	$5.09-5.24	$5.35-5.57	$6.16-6.31	$9.14	$9.29	$10.54	$10.69
New York	5.40-5.98	6.28-6.43	7.25-7.89	5.58-5.88	6.48-6.73	5.78	5.32-5.58	5.53-5.63	6.18-6.38	9.17-9.53	9.32-9.68	10.40-10.77	10.55-10.92
Boston	5.48-5.64	6.39	7.56-7.83	5.54-5.89	6.75-6.79	5.74	5.39-5.54	5.48-5.59	6.24-6.34	9.40-9.44	9.55-9.59	10.84-10.94	10.92-11.09
Baltimore	5.28	6.18	7.15-7.38	5.34	....	5.53	5.33-5.39	5.39	6.13	....	....	....	...
Chicago	4.85-5.10	5.75-5.95	7.15-7.30	4.85-5.30	6.15	5.10	4.90	4.90	5.70	9.35	9.60	10.80	11.05
Milwaukee	5.02-5.07	5.92	7.12-7.47	5.02-5.37	6.32	5.22-5.27	5.07	5.07	5.87	9.15-9.17	9.32	10.52-10.57	10.67-10.72
Norfolk	5.75	....	....	....		6.00	6.00	6.00	....	....	....		..
Cleveland	4.98-5.20	5.75[1]-6.04[1]	7.18-7.44	5.02-5.65	6.70	5.35-5.54	5.16-5.42	5.15-5.34	5.70-5.95	9.14-9.66	9.29-9.89	11.05	11.30
Buffalo	4.85	5.75	7.65	5.56	6.35	5.35	5.10	5.05	5.90	9.70	9.95	11.15	11.40
Detroit	5.20-5.55	6.05-6.50	7.70	5.25-5.70	6.25-6.55	5.50-5.55	5.30-5.37	5.30-5.52	6.02-6.07	9.31-9.55	9.20-9.47	10.72-10.95	10.87-11.10
Cincinnati	5.14-5.36[8]	5.82-6.21[8]	6.97-7.65	5.25-5.62[8]	6.31	5.50-5.71[8]	5.30-5.47[8]	5.30-5.62[8]	6.06-6.17[8]	9.31-9.35	9.50-9.51	10.75-10.76	10.90-10.91
St. Louis	5.19	6.04-6.09	7.29-7.64	5.19-5.79	6.49	5.39-5.44	5.24	5.24	6.04	9.69	9.94	11.14	11.39
Pittsburgh	4.85-4.90	5.75[1]	7.15	5.00-5.35	5.95	5.05-5.25	4.90-5.15	4.90-5.10	5.65-5.80	9.35	9.60	10.40	10.55-10.80
St. Paul	5.41	6.31	7.30-7.71	5.41	....	5.66	5.46	5.46	6.26	9.91	10.10	11.36	11.61
Omaha	5.92	....	9.18	5.92	....	6.17	5.97	5.97	6.77	....	....	....	.
Birmingham	5.05[1]	6.38	6.45	5.05[11]	6.38	5.25[11]	5.00[11]	5.00[11]	6.66	....	....	....	..
Houston	6.40	....	8.80	6.75	....	6.35	6.20	6.40	7.60	9.80	9.65	10.75	10.95
Los Angeles	6.30-6.40	7.85[1]-7.90	7.95-8.90	6.60-6.66	9.35[5]	6.10-7.40	5.75-5.90	6.05	7.85[15]-8.45	10.90	10.85	12.40	12.65
San Francisco	5.95[8]	7.15[2]	8.25-8.90	6.75[3]	8.25	6.30-7.60	5.90-6.90	5.90	7.55	10.90	10.85	12.40	12.65
Portland	6.50[4]	8.00[2]	8.15[2] 8.45[2]	6.85[4]	....	6.30[4]	6.25[4]	6.25[4]	8.25[4]	....	10.45[15]	....	12.05[15]
Seattle	6.20[4]-6.30[4]	7.75[2]-7.85[2]	7.65-8.00	6.55[4]-6.65[4]	....	6.20-6.30	6.15-6.25	6.05[4]-6.15[4]	8.00[14]-8.10[14]	....	10.30[15]-10.40[15]	....	12.00[15]-12.05[15]
Salt Lake City	7.05-8.00	8.20	7.90-9.06	7.10-7.59	....	5.75-6.65	6.65-7.00	6.95-7.25	7.55-8.40	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED:

Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED:

Sheets, 400 to 1999 lb; strip, extras on all quantities bars 1000 lb and over.

ALLOY BARS:

1000 to 1999 lb.

GALVANIZED SHEETS:

450 to 1499 lb.

EXCEPTIONS:

(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 500 to 1999 lb; (10) 500 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) up to 1999 lb.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	48.00	.....	.....	.....	.....
Birmingham	42.88	43.38	.....	.....	.....
Buffalo	47.00-48.00*	47.00-48.00*	47.50-48.50*	.....	.....
Chicago	46.00	46.50	46.50	47.00	.....
Cleveland	46.00	46.50	46.50	47.00	51.00
Duluth	46.00	46.50	46.50	47.00	.....
Erie	46.00	46.50	46.50	47.00	.....
Everett	....	49.50	50.00	.....	.....
Granite City	47.90	48.40	48.90	.....	.....
Ironton, Utah	62.00	62.50	.....	.....	.....
Lone Star, Texas	.....	75.00†	...	.....	.....
Neville Island	46.00	46.50	46.50	.....	.....
Provo	46.00	46.50	.....	.....	.....
Sharpsville	46.00	46.50	46.50	47.00	.....
Steelton	48.00	48.50	49.00	49.50	54.00
Struthers, Ohio	46.00	.....	.....	.....	.....
Swedeland	50.00	50.50	51.00	51.50	.....
Toledo	46.00	46.50	46.50	47.00	.....
Troy, N. Y.	.	.....	.....	.....	54.00
Youngstown	46.00	46.50	46.50	.....	.....

DELIVERED PRICES† (BASE GRADES)

Consuming Point	Producing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	.....	49.50	50.00	.....	....
Boston	Steelton	6.27	54.27	54.77	55.27	55.77	60.27
Brooklyn	Bethlehem	3.90	51.90	.....	.....	.....	.....
Cincinnati	Birmingham	6.09	48.97	49.47	.....	.....	.....
Jersey City	Bethlehem	2.39	50.39	..	.....	.....	.....
Los Angeles	Provo	6.93	52.93	53.43	.....	.....	...
Mansfield	Cleveland-Toledo	3.03	49.03-48.53	49.53-49.03	49.53	50.03	54.03 .....
Philadelphia	Bethlehem	2.21	50.21	.....	.....	.....	.....
Philadelphia	Swedeland	1.31	51.31	51.81	52.31	52.81	.....
Philadelphia	Steelton	2.81	50.81	51.31	51.81	52.31	56.81
San Francisco	Provo	6.93	52.93	53.43	.....	.....	.....
Seattle	Provo	6.93	52.93	53.43	.....	.....	.....
St. Louis	Granite City	0.75 Arb.	48.65	49.15	49.65	.....	.....

---

* Republic Steel Corp. price: Basis: pig iron at Buffalo set by average price of No. 1 hvy. mlt. steel scrap at Buffalo as shown in last week's issue of THE IRON AGE. Price is effective until next Sunday midnight.

† Low Phos, Southern Grade.

Producing point prices are subject to switching charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct. C/L per g.t., f.o.b. Jackson, Ohio —$59.50; f.o.b. Buffalo $60.75. Add $1.25 per ton for each additional 0.50 pct Si. up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus $66.00 per gross ton, f.o.b. Lyles, Tenn. Delivered Chicago, $73.78. High phosphorus charcoal pig iron is not being produced.

Ferromanganese

78-82% Mn, Maximum contract base price, gross ton, lump size.

F.o.b. Birmingham	$162
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	$160
F.o.b. Johnstown, Pa.	$162
F.o.b. Sheridan, Pa.	$160
F.o.b. Rockwood, Tenn.	$165
F.o.b. Etna, Pa.	$163

$2.00 for each 1% above 82% Mn; penalty, $2.00 for each 1% below 78%.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.0
Ton lots	11.6
Less ton lots	12.5

Spiegeleisen

Contract prices gross ton, lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$61.00	$62.00
Pgh. or Chicago	65.00	66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, packed	35.5
Ton lots	37.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	32
Ton lots	34
Less ton lots	36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, delivered.

	Carloads	Ton	Less
0.07% max. C. 0.06% P, 90% Mn.	25.25	27.10	28.30
0.10% max. C	24.75	26.60	27.80
0.15% max. C	24.25	26.10	27.30
0.30% max. C	23.75	25.60	26.80
0.50% max. C	23.25	25.10	26.30
0.75% max. C, 7.00% max. Ci	20.25	22.10	23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C.

Carload bulk	8.60
Ton lots	10.25
Briquet, contract basis, carlots, bulk delivered, per lb of briquet	10.0
Ton lots	11.6
Less ton lots	12.5

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct., f.o.b. Keokuk, Iowa, openhearth $84.00, foundry, $85.00; $84.75 f.o.b. Niagara Falls; Electric furnace silvery iron is not being produced at Jackson. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50 pct. Mn over 1 pct.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 1 lb Si briquets.

Carload, bulk	5.90
Ton lots	7.50
Less ton lots	8.40

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size, bulk, in carloads, delivered.

25% Si	17.50
50% Si	10.50
75% Si	13.00
85% Si	14.65
90-95% Si	16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max. Si)

0.06% C	28.75
0.10% C	28.25
0.15% C	28.00
0.20% C	27.75
0.50% C	27.50
1.00% C	27.25
2.00% C	27.00
65-69% Cr, 4-9% C	20.50
62-66% Cr, 4-6% C, 6-9% Si	21.35

Briquets — Contract price, cents per pound of briquet, delivered, 60% chromium.

Carload, bulk	13.75
Ton lots	15.25
Less ton lots	16.15

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carload	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carload	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, cents per lb. chromium contained packed, delivered, ton lots. 97% min. Cr. 1% max. Fe.

0.20% max. C.	1.09
0.50% max. C.	1.05
9.00% min. C.	1.04

Calcium—Silicon

Contract price per lb. of alloy, lump, delivered.

30-33% Ca, 60.65% Si, 3.00% max. Fe.

Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CMSZ

Contract price, cents per pound of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max, St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Ton lots and carload packed	18.00¢
Less ton lots	19.50¢

SMZ

Contract price, cents per pound of alloy, delivered. 60-65% Si, 5-7 Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.25
Less ton lots	18.50

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered	$2.25
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained, V.	
Openhearth	$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound Contained V_2O_5	$1.20
Ferrocolumbium, 50-60% contract basis, delivered, per pound contained Cb.	
Ton lots	$2.75
Less ton lots	2.80
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo.	95¢
Calcium molybdate, 45-50%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo.	80¢
Molybdenum oxide briquets, f.o.b. Langeloth and Washington, Pa., per pound contained Mo.	80¢
Molybdenum oxide in bags, f.o.b. Langeloth and Washington, Pa., per pound contained Mo.	80¢
Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti	$1.23
Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti	$1.40
Less ton lots	1.45
High carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton	$160.00
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton	$65.00
10 tons to less carload	75.00
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per pound of alloy.	
Carload, bulk	6.60¢
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	8.40¢
Ton lots	9.30¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk	11.00
Ton lots, packed	11.25
Less ton lots	11.75

Boron Agents

Contract prices per pound of alloy, delivered.

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D.	
Ton lot	$1.20
Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. X D, delivered.	
Ton lots	$1.67
Less ton lots	1.79
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	$1.80
Silcaz, contract basis, delivered.	
Ton lots	45.00¢
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, f.o.b. Suspension Bridge, N. Y., freight allowed, Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.	
Ton lots, per pound	8.625¢
Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	$6.25

(CONTINUED FROM PAGE 90)

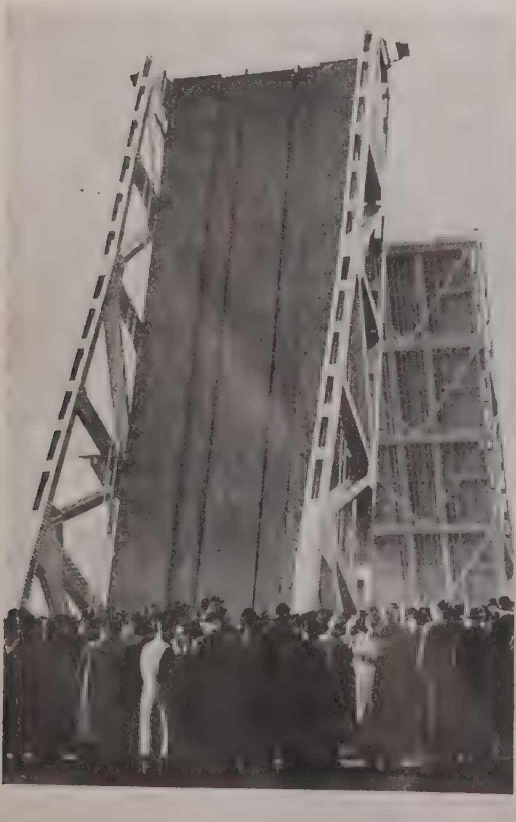
The first has already been discussed. It is to cling on to the present position while economic unrest and Communist treachery gradually lead to the crumbling of the regime. The second is to seek some sort of rapprochement with the west.

There should be no mistake about the amount of crow Tito would have to swallow to achieve even a minimum understanding with the western Powers. It may not seem that their terms are heavy. Indeed, they are not. Nevertheless, they demand some striking departures from current Yugoslav practice. In the economic field the British must demand the payment of reasonable compensation to nationalized British interests in Yugoslavia. This may stick in the throats of demagogues who for years past have demanded the expropriation of the foreign capitalist plunderers, but surely British firms may ask for terms as favorable as have already been granted to Swedes and Swiss? This economic precondition of better relations is, however, relatively unimportant compared with the demands which must be put forward in relation to Tito's foreign policy. Yugoslavia would surely be required to cease all aid to the Markos rebels; to stop military threats to the frontier of Trieste and subversive activity within the city itself; and to show neutrality in the event that the western Powers should be obliged to take any action against Albania. It would probably be unwise to press the point further and to demand a more general detachment from Soviet diplomacy. But, in the Balkans, the western conditions are limited and specific and therefore stand a better chance of being the basis of a bargain.

The most delicate point of all, however, is the question of political freedom for the friends of the west inside Yugoslavia. Tito is a convinced Marxist, and does not intend to abandon his aim of transforming Yugoslavia into a state of the Soviet type. The western Powers on their side are not dictating the social system of Yugoslavia; they wish neither to overthrow nor to bolster up the Tito regime as such. They do object, however, to the persecution of Yugoslav subjects who have shown themselves their friends, simply and solely because they are their friends. But Tito no doubt fears that if he releases those unjustly imprisoned and relaxes police pressure on western sympathizers he will soon find himself dependent on the support of **non-Communists.** Then the dictatorship of the Communist Party will have to be modified, non-Marxist democrats will recover influence, and the achievement of Communism in Yugoslavia will be indefinitely postponed. This is the real dilemma facing Tito — to modify his program of total Communism or to risk the total disappearance of his regime, to choose between a partial loss of power or a complete loss of power and possibly of life as well.

TITO is not, however, alone in facing this unpalatable choice. He must consider the men around him. He, trained in the Comintern, might prefer everything to capitulation to the west. But what of his colleagues? The top ranks of the Yugoslav armed forces and bureaucracy are filled with men who have not long been—and some who are still not—members of the Communist Party. They joined or supported the Party during the war, because it stood for resistance to the Axis and a social revolution which they hoped would sweep away the rot of past regimes. These men have always been passionate nationalists. For them, the victory of the Partisans was to mean the regeneration and territorial expansion of Yugoslavia, which was to become a powerful state, almost a Great Power. They favored Russia because they thought it the generous big brother of all Slavs, both a mighty military force and a land of liberty and justice. But events are showing them that the threat to Yugoslavia's independence, let alone its future greatness, comes not from the west but from Russia. It is the Soviet Union that is the imperialist Power.

It is with these men that the western Powers should seek in the first place to establish contact. If a reorientation is to be brought about in Tito's policy, it is most likely to come as a result of their pressure and influence. The methods whereby such contacts can best be made cannot usefully be canvassed in public. But there is one means which cannot and must not be overlooked—radio propaganda, or to use the more exact language of four years ago, political warfare. From Britain at least the Yugoslavs must hear, in their own language, an explanation of the real dangers.

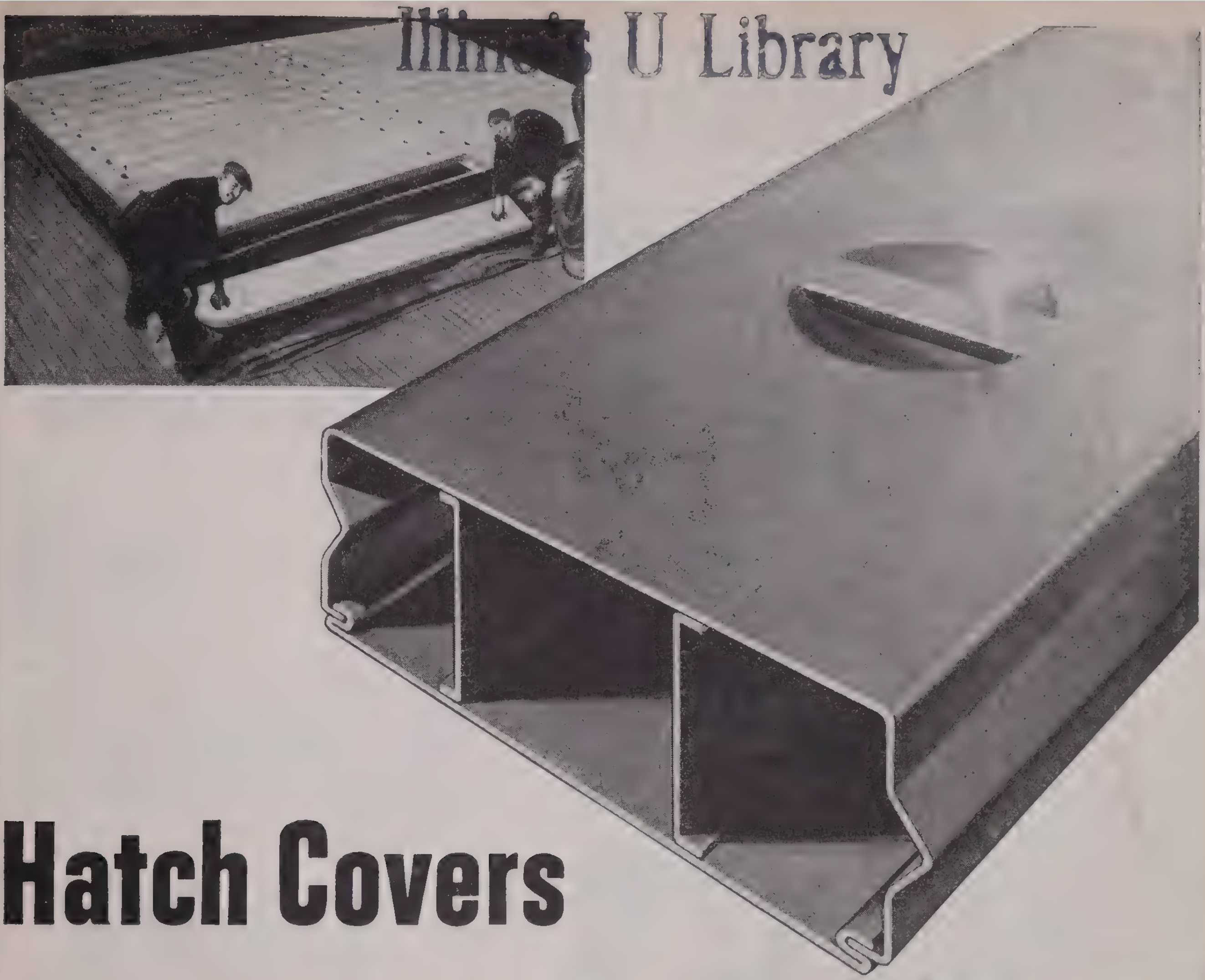


○ ○ ○

ALUMINUM BRIDGE: *Minister of Supply, Rt. Hon. A. J. Barnes is shown opening what is claimed to be the first aluminum alloy bascule bridge in the world at Port of Sunderland, Britain. Four 25 hp electric motors raise the leaves in 60 to 80 sec, in the same manner as those of the Tower Bridge in London.*

○ ○ ○

Illinois U Library



Hatch Covers MADE FROM Cold-Formed Shapes

This water-tight hatch-cover section, used by leading steamship operators, is made from Bethlehem Cold-Formed Shapes. It is manufactured in widths of 12 in., in varying depths, and in lengths to meet all hatch beam arrangements for unsupported spans up to 10 ft. The section is reinforced internally with two longitudinal channel stiffeners, and is packed with approved marine insulation for added protection against fire.

Sections for hatch covers are but one of a long line of products which are being made today, either wholly or in part, from Bethlehem Cold-Formed Shapes. And in many types of industry new uses are continually being discovered for these economical, easy-to-use shapes.

Bethlehem Cold-Formed Shapes are produced from strip, sheets or plates. They are uniform in thickness, and have an excellent strength-weight ratio. Their surface is virtually scale-free. They're made in all gauges from 7 to 24, inclusive. Because of our complete manufacturing facilities we are able to meet practically every requirement.

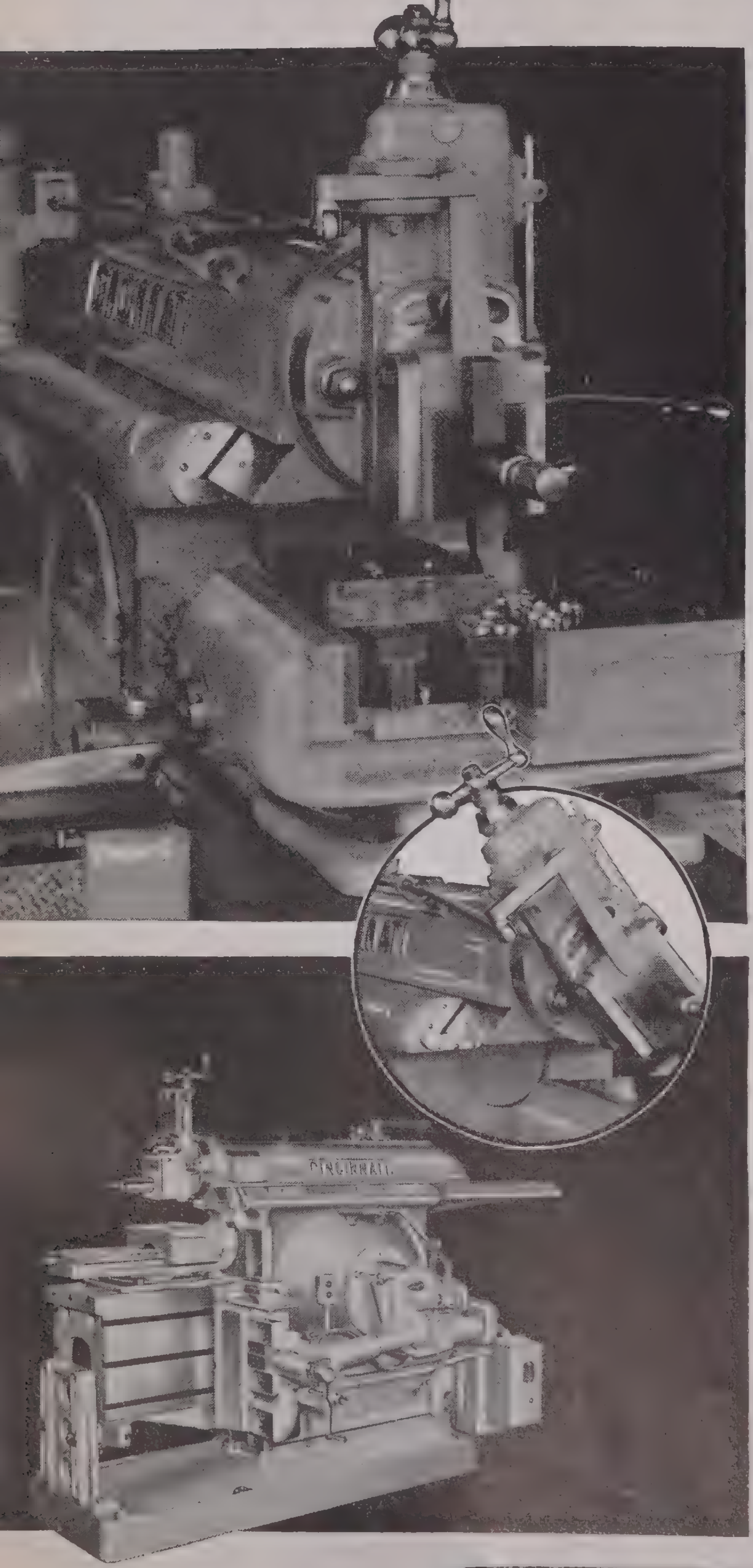
There may be places where Bethlehem Cold-Formed Shapes could be used to your advantage in some of your products. Why not talk it over with us?

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

★ BETHLEHEM STEEL ★

Millions of cuts . . .



with the NEW CINCINNATI TOOL LIFTER

DURABLE

The Cincinnati Tool Lifter, a new development, operates millions of times without a fault. A successful tool lifter must be certain in action on each stroke to prevent tool damage. It must *continue* to be certain month after month, year after year, for millions of operations. The Cincinnati Tool Lifter, with positive return as well as positive lift, is outstandingly successful.

VERSATILE

Efficient at high speeds or low, long strokes or short—dependable at different positions or angular settings of tool slide—or clapper box, the Cincinnati Tool Lifter is truly versatile and productive.

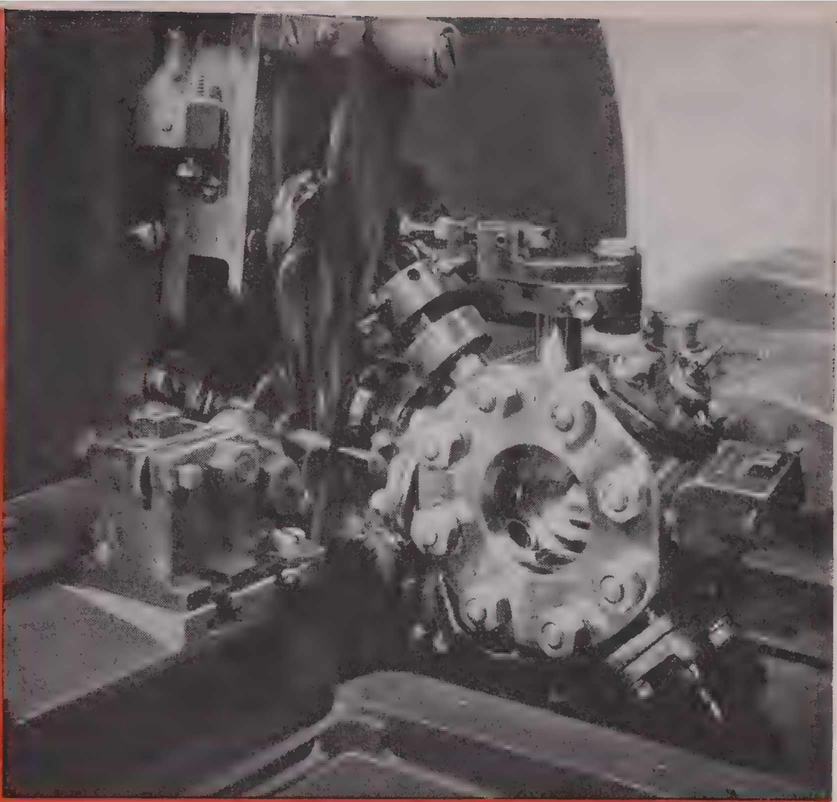
AUTOMATIC

It relieves operators and greatly increases speed of cutting. After simple setting it is automatic.

SPEEDY

Carbide and high-speed cutting tools both operate to greater advantage when protected by a Cincinnati Tool Lifter.
Write for Catalog N-3.

THE CINCINNATI SHAPER CO.
CINCINNATI 25, OHIO U.S.A.
SHAPERS · SHEARS · BRAKES



Cut Your metal cutting costs

Use Texaco cutting coolants for faster machining, finer finish, fewer rejects

DRILLING, grinding, milling, turning — whatever the metal or machining method — there is a top-quality *Texaco Cutting, Grinding or Soluble Oil* to help you do every metal cutting job in your plant faster, better, and at minimum cost.

Texaco Cutting, Grinding and Soluble Oils lubricate effectively. They keep tool and work cool — prevent chip welding or wheel loading. They prolong tool life, assure cleaner cuts and smoother finish, increase production and lower costs wherever they are used.

A Texaco Lubrication Engineer who specializes in cutting coolants will gladly help you select — and use effectively — the Texaco cutting coolants you need for best results.

Just call the nearest of the more than 2300 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO CUTTING, GRINDING AND SOLUBLE OILS FOR FASTER MACHINING

Tune in . . . TEXACO STAR THEATRE presents MILTON BERLE every Wednesday night. METROPOLITAN OPERA broadcasts every Saturday afternoon.

THE IRON AGE, published every Thursday by the *CHILTON CO. (INC.)*, Chestnut and 56th Sts., Philadelphia 39, Pa. Entered as second class matter Nov. 8, 1932, at the Post Office at Philadelphia under act of March 3, 1879. $8 yearly in United States, its territories and Canada; other Western Hemisphere Countries $15; other Foreign Countries $20 per year. Single Copies 35¢. Annual Review Number, $2.00. Vol. 162, No. 26

How would you make SPOT WELDS

TRADE HELIARC MARK

LINDE'S new HELIARC torch for making spot welds with contact from only one side.

Net Weight	2 lb.
Length (barrel)	10 in.
Capacity	250 amp.

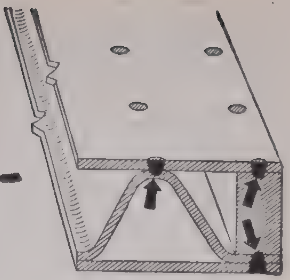
One hose makes the spot welding torch as light and portable as an oxy-acetylene blowpipe.

Trigger action

Push button control of electrode adjustment

With the HELIARC torch on the assembly line, you can easily make spot welds in those hard-to-get-at places. Other applications are just as easy.

IN PLACES LIKE THESE?



Full Scale

"HELIARC" TORCH SPOT WELDING can do it easily and quickly

Torch spot welding is a new use for inert-gas-shielded arc welding that fills a long-felt gap in sheet metal assembly methods. Spot welds are made by a light pistol-grip torch that requires access to the work from only one side.

Does many jobs

You can use this new Heliarc torch for many types of spot welding work. It is especially useful where the structure is large or of complicated shape because welding is done from one side and no forging pressure is required. You can spot weld ducts, tubes, containers, brackets, handles and many other assemblies. Mild steel, low alloy or stainless steel .030 to .064 in. thick are the metals that can now be welded. Not only can you join sheets of these metals in one to two seconds per spot, but you can also join a sheet of metal to underlying material of any thickness. Thus, corrosion resistant sheets can be spot welded to mild steel plate to provide cladding.

Easy to use

It's no trick to weld with the pistol-grip Heliarc HW-8 Spot Welding Torch. Just press the "muzzle" of the "gun" against the work and pull the trigger.

Low-cost power equipment is another feature of this process that makes it attractive. A regular 300 amp. welding transformer with high frequency unit is all that is needed to supply the power. Power return is by ground lead clamped to the work at any convenient location. A timer control automatically takes care of operating the accessory equipment.

Equipment is simple

Only one hose assembly connects the torch to the accessory equipment which can thus be placed out of the way to leave the entire work area free. The standard hose assembly is 25 ft. long. The hose is about an inch in diameter and contains conductors for power cable, cooling water, shielding gas, and trigger control. Electrode adjustment is easily made by push-button control located on the torch. All of these features make the spot welding torch easy and natural to use and as light and portable as an oxy-acetylene blowpipe.

The ease of use and quality of work done with Heliarc torch spot welding makes it an ideal production line tool. Contact any Linde office for additional information about this new spot welding process.

The words "Linde" and "Heliarc" are registered trade-marks of The Linde Air Products Company.

Linde
Trade-Mark

THE LINDE AIR PRODUCTS COMPANY
Unit of Union Carbide and Carbon Corporation
30 E. 42nd St., New York 17, N. Y. UCC Offices in Other Principal Cities
In Canada: DOMINION OXYGEN COMPANY, LIMITED, Toronto

Trim high grinding costs for Christmas

Grinding costs can take a trimming this Christmas season and for many seasons to come. If you would like to shape your production costs by paring down your dressing expenses, sprucing up high stock removal and long wheel life, Peninsular engineers may be able to help you.

Manufacturers in over fifty industrial fields have been shown how to trim down grinding costs by Peninsular consultants. Since 1889, Peninsular has had a program of study and experimental research designed to help them with their particular grinding problems. *Why not call on Peninsular engineers to study your grinding job?*

First, they will conduct an on-the-grounds analysis of your grinding machines, the methods you employ, and the materials you grind. Correct wheel formulas are then drawn up and presented to you. Our engineers will include recommendations developed to reduce your costs and increase your production.

Thought for any season: Every Peninsular grinding wheel is specifically designed for a particular grinding job.

The Peninsular Grinding Wheel Co., 729 Meldrum Avenue, Detroit 7, Michigan. *Sales Offices:* Chicago, Philadelphia, Buffalo, Cleveland, Pittsburgh, Houston, St. Louis, Cincinnati.

PENINSULAR

INDIVIDUALLY ENGINEERED

GRINDING WHEELS

SINCE 1889

SPECIALISTS IN RESINOID BONDED WHEELS

This Christmas tree, made of standard sizes and types of Peninsular grinding wheels, gained such favorable comment in its original appearance that it is again reproduced with season's greetings from Peninsular.

From start to finish . . .

IT'S ALL

Barium

WE melt the steel, cast the ingots, heat and forge, all under one roof. That's why we know that you can't buy better forgings anywhere.

Barium forgings are rough machined and inspected under the same roof.

We produce forgings in carbon, alloy, stainless or tool steel weighing 5 to 50,000 lbs.

HERE ARE SEVEN-TON DISCS FORGED FROM BARIUM'S STEEL:

1. As forged — from the press.
2. Partially machined and heat treated.
3. Completely rough turned after heat treatment.

Barium

STEEL & FORGE, INC.
CANTON 1, OHIO

NEW YORK • BOSTON • PHILADELPHIA • CHICAGO
DETROIT • CLEVELAND • PITTSBURGH • BALTIMORE
CINCINNATI • ST. LOUIS • LOS ANGELES • HOUSTON

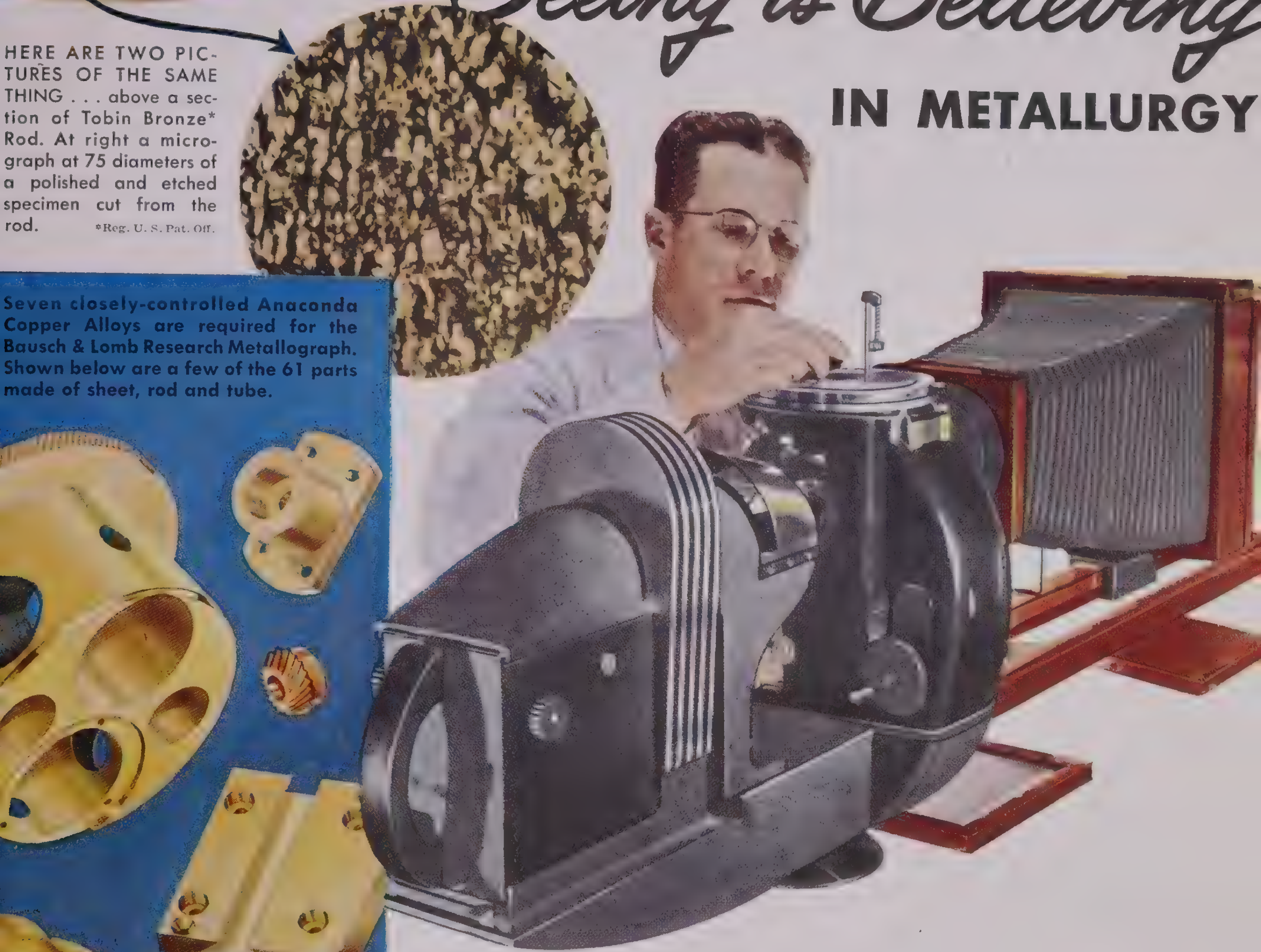
A SUBSIDIARY OF
Barium
STEEL CORPORATION
Steelwright to the Nation

Remember . . . if it's a forging . . . buy it from Barium

HERE ARE TWO PICTURES OF THE SAME THING . . . above a section of Tobin Bronze* Rod. At right a micrograph at 75 diameters of a polished and etched specimen cut from the rod. *Reg. U. S. Pat. Off.

Seeing is Believing

IN METALLURGY



Seven closely-controlled Anaconda Copper Alloys are required for the Bausch & Lomb Research Metallograph. Shown below are a few of the 61 parts made of sheet, rod and tube.

YOU'LL FIND few better examples of precise workmanship and careful selection of materials than this latest model of the Bausch & Lomb Research Metallograph. With this precision instrument a skilled laboratory technician may examine and photograph metal structure at high magnification. To build it Bausch & Lomb use 61 parts made from seven Anaconda Copper Alloys. Eight parts are formed from tube, 16 from strip and 37 from rod.

Of what advantage are these alloys? First, they provide accurate, smooth surfaces on delicate working parts. They lead to production economies through higher speeds and longer tool life. Availability of just the right alloy for a specific purpose is typified by the use of Anaconda Alloy 243 (with low lead content) for parts requiring knurling. Also there's ease and economy in applying finishes such as light-absorbing matte-black, or gleaming chromium plate.

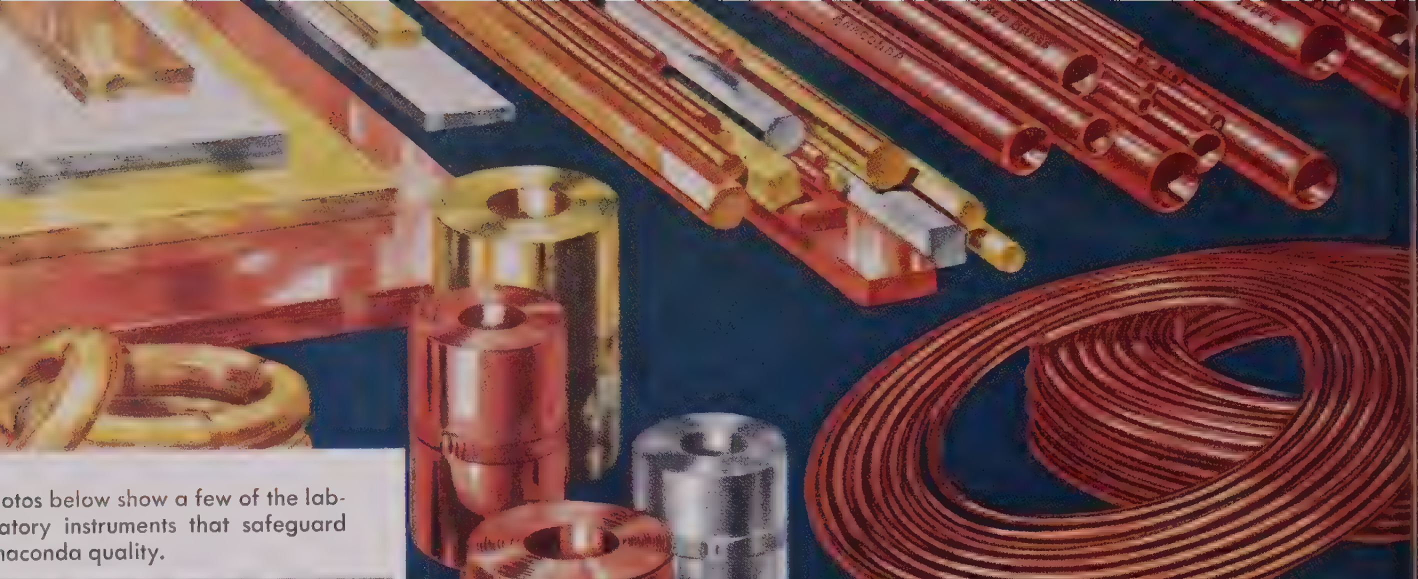
Manufacturers in general may be sure that the wide range of Anaconda Metals will blanket their needs. You can depend on the right composition, temper and grain size for a given part, whether it is to be machined, forged, rolled, spun, stamped, pressed, coined, upset or drawn.

Next Page Please . . .

ANACONDA
from mine to consumer

THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut

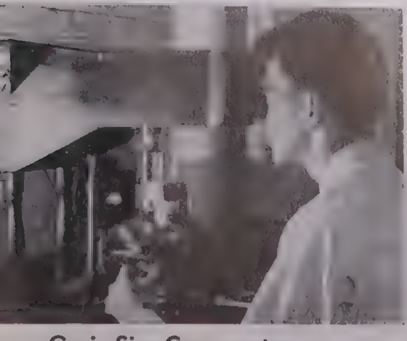


otos below show a few of the lab-
atory instruments that safeguard
naconda quality.

A.R.L. Densitometer-Comparator

Evelyn Photo-Electric Colorimeter

Picker X-ray Diffraction Unit



Grain Size Comparator

Quality Control

AT THE MILLS

EXTENSIVE, routine use of the new Bausch & Lomb Research Metallograph (described on preceding page), and many other tools of modern metallurgical research, assures the utmost uniformity and dependability in Anaconda Copper and Copper Alloys.

At the turn of the century, The American Brass Company, already the largest fabricator of copper and copper alloys, led the way in the search for greater metallurgical knowledge, and instituted laboratory control of alloy compositions to replace the father-to-son methods of mixture determination that had prevailed from the beginnings of the industry.

From that day on, the activity and responsibilities of the Technical Department have grown with the rapid advance of technical knowledge and instrumentation. Today more than half a million tests are made annually in the course of maintaining laboratory control over all mill operations and practices.

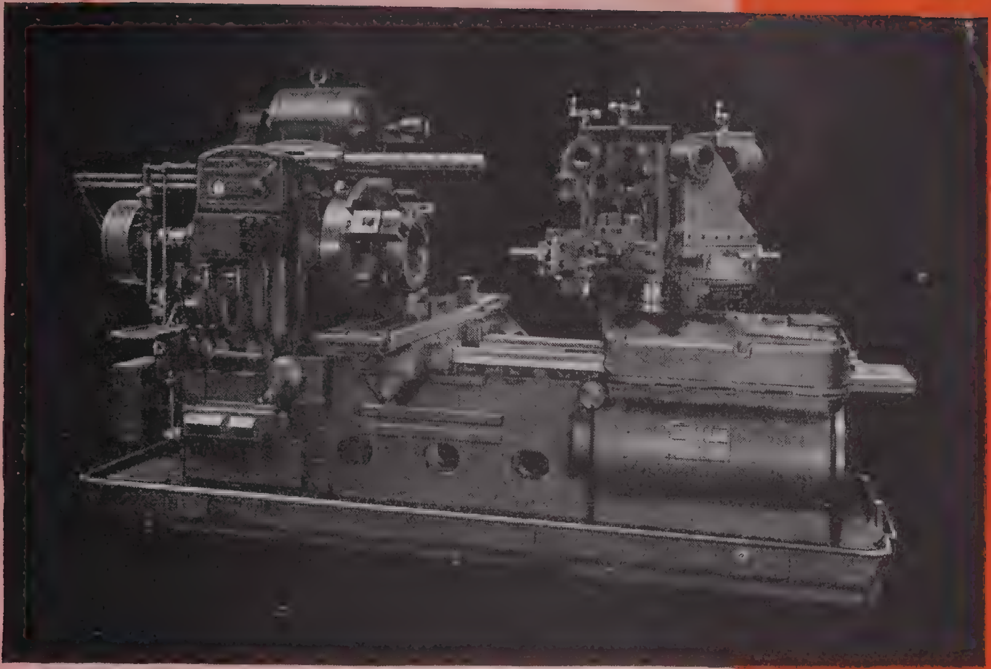
Such planned research and routine quality control is your assurance of Anaconda Metals that will fully meet your manufacturing requirements.

48119

THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut
Subsidiary of Anaconda Copper Mining Company
In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

***Anaconda* COPPER and COPPER ALLOYS**



6DRE

Advanced features...*of the* P&J 6DRE AUTOMATIC TURRET LATHE *contribute to lower cost production . . . of large duplicate parts*

The 6DRE series of automatic turret lathes are designed with the power, rigidity and control convenience to enable them to handle the production of large parts economically. Versatility in tooling, characteristic of all P&J machines, makes them adaptable to a wide range of work.

These machines are provided with 4 automatic changes of spindle speed, 3 selective automatic changes of feed and automatic binding of turret after indexing. Other features are direct slide action, and a motor driven constant rapid traverse motion to cross slide and turret slide.

P&J Methods Engineers are available to assist you in taking advantage of the production possibilities of this and other machines in the P&J line to cut your costs of machining duplicate parts.

For more complete information send for catalogue 1a/25a.

CONDENSED SPECIFICATIONS

	6DRE	*6DREL*	*6DRELX*
Swing over bed	**34″**	**34″**	**34″**
Cross Slide Travel (each way)	**8½″**	**8½″**	**6¼″**
Turret Faces	**5**	**5**	**6**
Turret Slide Travel	**18″**	**25″**	**28″**

OTHER P&J AUTOMATIC TURRET LATHES

- **Model 3U** (Swing over cross slide: [illegible])
- **Model 4D** (Swing over bed: 21″)
- **Model 5D** (Swing over bed: 25″)
- **Model 5D-2** (2-spindle. Swing limited by Spindle to Spindle Center Line Distance 10½″-15½″)
- **Model 6DS** (Swing over bed: 34″ and 40″)
- **Model 8DT** (Swing over bed: 36″)

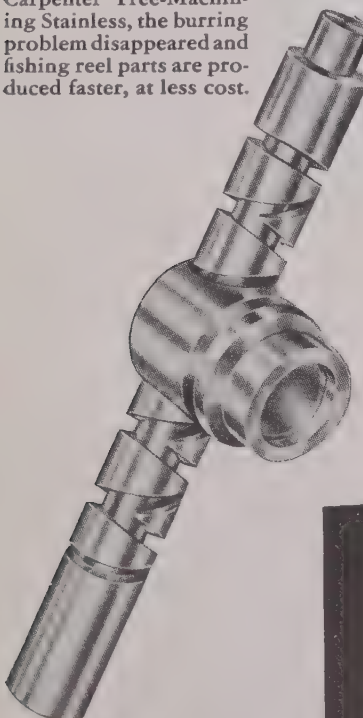
POTTER & JOHNSTON COMPANY
PAWTUCKET, RHODE ISLAND
Subsidiary of
Pratt & Whitney
division Niles-Bement-Pond Company

When You Want New Ways to Reduce MACHINING COSTS ON STAINLESS JOBS

—use this *Carpenter* help!

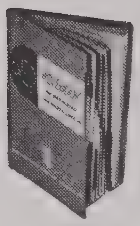
NO MORE COSTLY HAND WORK...

Excessive burring during machining caused rejects, or expensive hand work to "salvage" the parts from the scrap heap. Because of the change to Carpenter Free-Machining Stainless, the burring problem disappeared and fishing reel parts are produced faster, at less cost.



You Can Turn It Out AT LESS COST with Carpenter Free-Machining Stainless!

The cost of the steel you buy is only a fraction of the cost of the finished products made from Stainless. To get a lower *unit* cost for every Stainless part you make, take advantage of the help that Carpenter can give you.

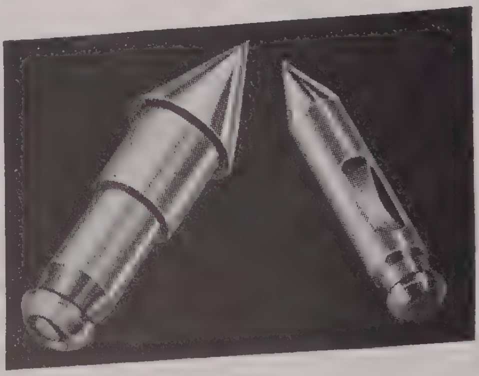


Our help starts with the *uniformity* of the free-machining Stainless you buy from your Carpenter warehouse. Every lot machines the same, to the finish you want.

Next, Carpenter's STAINLESS MACHINING "NOTEBOOK" gives correct information on speeds, feeds and tooling, etc.... and Check Charts that list common "trouble spots" with shop tips on how to cure them. For your NOTEBOOK, send us a note on your company letterhead, indicating your title, please. Extra copies of the NOTEBOOK, for the men in your shop, are available at 50¢ each.

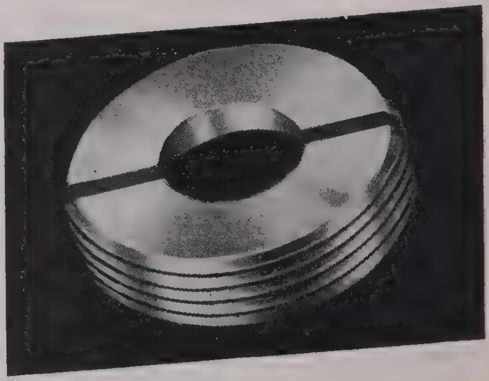
Using Carpenter's SHOP HELP ON NEW JOBS is another way to bring down the cost of working with Stainless, where special requirements or close tolerances are important. Combine your nearby Carpenter representative's experience with easy-to-work Carpenter Stainless bars, and you have a large part of the answer to low cost machining on your Stainless jobs. Get in touch with the nearest office listed below.

THE CARPENTER STEEL COMPANY, 121 West Bern Street, Reading, Pa.



MORE PARTS PER DAY...

Actual time records show an increased number of parts per day, flawless finishes and longer tool life now that Carpenter Stainless No. 8 (Type 303) is used for these corrosion-resistant valve needles.



UNIT COST: 5¢

Production slow—rejects excessive and unit costs "impossible" until Carpenter Stainless No. 8 (Type 304) was used for making this bearing race. Unit cost is now only 5¢... tool life has more than doubled and rejects have dropped 40%.

Carpenter

FREE-MACHINING

STAINLESS STEELS

Export Department: 233 Broadway,
New York 7, N.Y. "CARSTEELCO"

When You Want *Rush* Delivery Call Your *Carpenter* Warehouse—

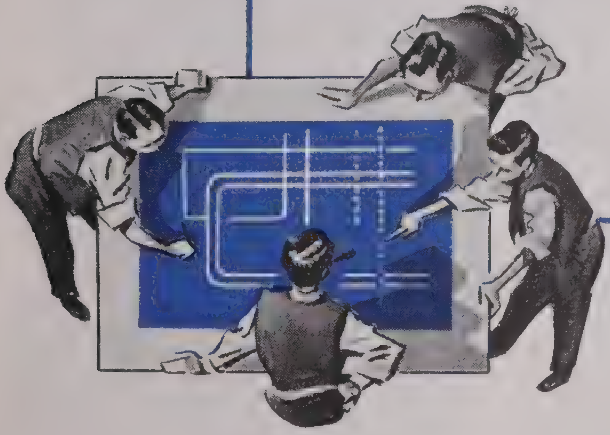
more than corrosion resistance

BOSTON
BRIDGEPORT, CONN.
BUFFALO
CHICAGO
CINCINNATI
CLEVELAND
DAYTON
DETROIT
HARTFORD
INDIANAPOLIS
LOS ANGELES
NEW YORK
PHILADELPHIA
PROVIDENCE
ST. LOUIS
WORCESTER, MASS.

SEE THE CLASSIFIED SECTION OF YOUR TELEPHONE DIRECTORY

To Your Specifications

for



OSTUCO

TUBING

SEMI-FINISHED PARTS

SUB-ASSEMBLIES

Hundreds of manufacturers are saving time and money by having OSTUCO fabricate their semi-finished parts and sub-assemblies. They furnish the blueprints and we do the work. Thus they reduce the number of production operations performed in their plants . . . relieve production bottlenecks and increase productive output.

It's quite possible that OSTUCO Tubing fabricated to your specifications can speed up the production of your products and reduce your costs. Why not check with our nearest sales office or write today.

OSTUCO TUBING

OSTUCO

THE OHIO SEAMLESS TUBE COMPANY

Plant and General Offices: SHELBY, OHIO

SALES OFFICES: CHICAGO, Civic Opera Bldg., 20 North Wacker Dr. CLEVELAND, 1328 Citizens Bldg. • DAYTON, 1517 E. Third Street DETROIT, 2857 E. Grand Blvd. • HOUSTON, 927 A M & M Bldg. • LOS ANGELES, Suite 200-170 So. Beverly Drive, Beverly Hills • MOLINE, 225 Fifth Avenue Bldg. • NEW YORK, 70 East 45th St. • PHILADELPHIA, 1413 Packard Bldg., 15th & Chestnut • ST. LOUIS, 1230 North Main St. • SEATTLE, 3205 Smith Tower • SYRACUSE, 501 Roberts Ave. CANADIAN REPRESENTATIVE: Railway & Power Corp., Ltd., HAMILTON, MONTREAL, NORANDA, NORTH BAY, TORONTO, VANCOUVER and WINNIPEG.

Use FERROCARBO-S BY CARBORUNDUM

TRADE MARK

in basic ELECTRIC STEEL PRACTICE

For Reduced Time of Heat

FERROCARBO-S silicon carbide grain is used as a deoxidizing agent to effect faster shaping up of slag in basic electric steel making.

For Easy Slag Manipulation

Because slags remain carbidic throughout the heat—less supervision and effort is required to maintain good slag condition at all times.

For Recovery of Costly Alloys

In tool steel and high alloy steelmaking, FERROCARBO-S grain is applied successfully to both single and double slag processes for the reduction of metallic oxides.

● These advantages are included among desirable benefits experienced in largest basic steel plants. For complete detailed information, call in our distributors or write direct.

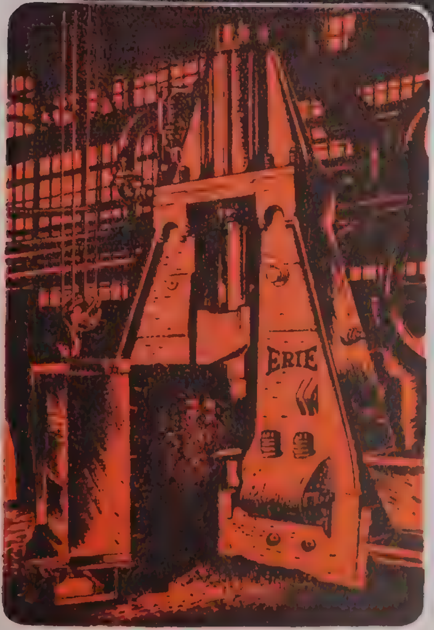
THE CARBORUNDUM COMPANY, Bonded Products and Abrasive Grain Division, Niagara Falls, New York

FERROCARBO Distributors: Kerchner, Marshall & Co., Pittsburgh, Cleveland, Birmingham, Philadelphia and Buffalo; Miller and Company, Chicago, St. Louis and Cincinnati

"Carborundum" and "Ferrocarbo" are registered trademarks which indicate manufacture by The Carborundum Company

FORGINGS are only as good as THE HAMMERS that make them

A Battery of Erie Steam Hammers in The Drop Forging Division of Willys Overland Motors Inc



ERIE HAMMERS *Prove This Truth!*

AUTOMOTIVE FORGINGS must meet stresses in operation which cannot be anticipated fully. Design and manufacture must provide a margin. Road conditions, loads, drivers . . . all these and more, impose on steering knuckles, spindles, radius rods, crankshafts, connecting rods, for example, demands for strength, toughness and ruggedness which must be inherent in forgings of minimum weight. In making such forgings Hammergangs like the instant control response of Erie Hammers. They swear by the dependability of their Eries. The ruggedness and ability to take it under the conditions of speedy production with no sacrifice of quality in the forgings, are inbuilt characteristics of Erie steam and board drop hammers, single and double frame forging hammers, pneumatic and air operated hammers. For over a half century Erie Hammers have been proving their superiority by turning out forgings that deliver top performance in every industrial application.

ERIE

ERIE FOUNDRY COMPANY • ERIE, PA.

ERIE BUILDS *Dependable* HAMMERS

Advance
PAINT COMPANY

5 GALLONS OF LACQUER

50 YEARS OF EXPERIENCE

Here's a drum of Advance Lacquer. It contains fifty years of experience . . . and five gallons of a fine finish.

Service technicians of the Advance Paint Company have developed formulations to solve thousands of individual finishing problems. As a result, characteristics have been built into Advance finishes that make them easy to apply and quick to dry, speeding up your finishing operations. All the metal finishes manufactured by the Advance Paint Company are made to satisfy the most exacting requirements . . . are adapted to low-cost finishing operations.

This experience can go to work for you. An Advance field representative will come into your plant to help you solve *your* finishing problems.

Manufacturers of Industrial Finishes

Advance PAINT COMPANY
INDIANAPOLIS, INDIANA

ONE OF THE REAL JOYS
OF THE YULETIDE
SEASON
IS THE OPPORTUNITY
IT AFFORDS US
TO LAY ASIDE THE ROUTINE
OF DAILY BUSINESS
AND IN TRUE SINCERITY
WISH ALL OUR FRIENDS
A VERY MERRY CHRISTMAS
AND A HAPPY NEW YEAR

UNITED ENGINEERING AND FOUNDRY COMPANY
PITTSBURGH, PENNSYLVANIA

Longer Life . . . Less Maintenance for PENN Truck Bodies with J&L JALLOY

HEAT-TREATED STEEL

J&L STEEL

Leading Dump-Truck Body Builder Pioneers Use of Heat-Treated Steel for Bottom Plates

Hockensmith Corporation, Penn Body Division, of Penn, Pa., puts real meaning in its slogan: "*Strength · Service · Economy*" by using J&L Jalloy and Otiscoloy steels.

J&L Heat-Treated Jalloy for truck bottoms resists the terrific shocks and abrasion encountered in heavy-duty operations, while J&L Otiscoloy High-Tensile Steel frame members and other parts reduce dead-weight to a minimum without sacrificing strength.

One mine operator reports that his stone trucks equipped with heat-treated Jalloy run an entire season without bottom replacements—an unheard of record in the mining industry where the materials handled are highly abrasive. In addition because longer wear reduces repair, his maintenance welding crew has been cut *84%* since using Jalloy!

J&L Jalloy is a *modern* steel for products that must be tough and strong—heavy-duty truck bodies, power-shovel buckets, dump-cars, bulldozers, scrapers, rock crushers, sand-blast equipment, and wherever abrasion is a limiting factor in the life of a product.

J&L Jalloy—a fine-grain, heat-treated steel—has an inherent ability to withstand impact and abrasion. A wide range of physical properties, with strengths up to *155,000 lbs. per sq. inch*, are available.

If you need a steel with *better* abrasion resistance, or if you want longer life from products made of steel, let us send you data on J&L Jalloy, including information on properties, heat-treatments and workability. The data booklet: "Jalloy—J&L Alloy Steel" is available on request. Use the coupon.

Jones & Laughlin Steel Corporation
Room 403, Jones & Laughlin Building
Pittsburgh 30, Pennsylvania

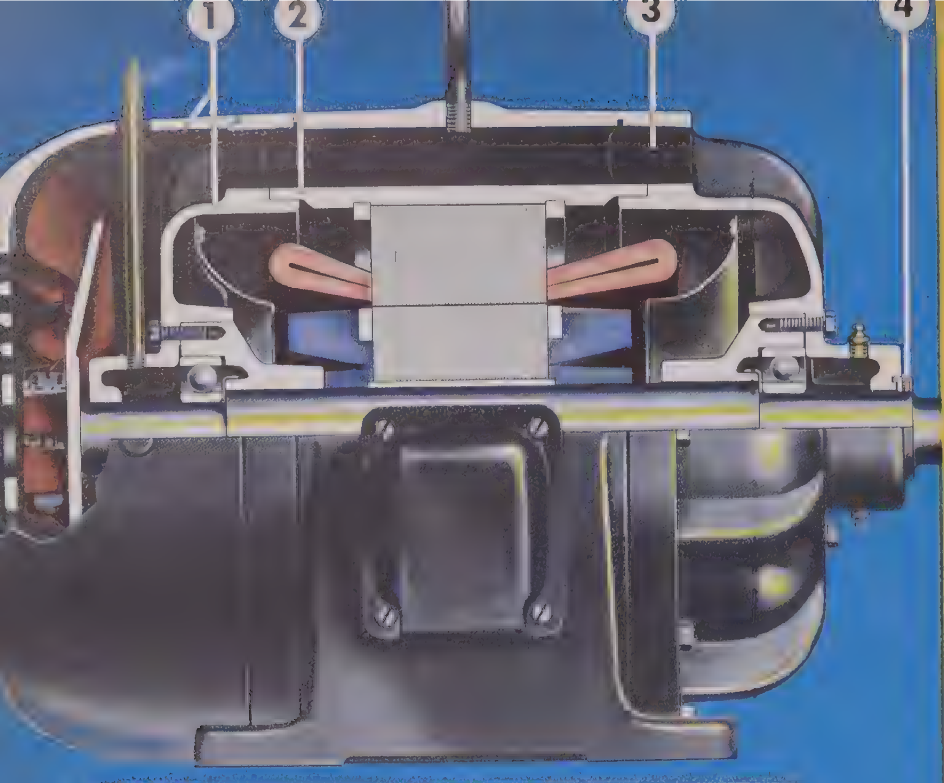
Please send me complete data on Jalloy and the booklet: "Jalloy—J&L Alloy Steel."

NAME____________________
TITLE____________________
ADDRESS____________________
CITY__________ STATE__________

JONES & LAUGHLIN STEEL CORPORATION

YOU CAN PUT A
TRI CLAD
REG US PAT OFF
MOTOR ANYWHERE
GENERAL ELECTRIC

HERE'S



The standard totally enclosed Tri-Clad features a *cast-iron* double-wall structure (1) that keeps outside air from electrical operating parts . . . machined-fit end shields (2) . . . large air passages (3), easy to clean . . . rotating labyrinth seals (4) that keep foreign matter from working in around the shaft. Note, too, the new corrosion-resistant G-E Textolite cooling fan is now standard on all 1- to 15 hp TEFC Tri-Clads.

You can put a TRI CLAD motor anywhere

YES SIR! The standard *Tri-Clad* open motor is a *cast-iron, dripproof* motor you can put anywhere that *any* open motor can be used—and in a lot of places where other open motors couldn't take it.

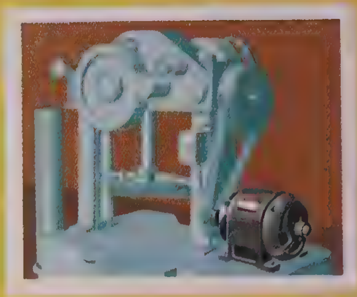
What's more, for the really dirty jobs—where air is laden with dust, or corrosive fumes—where metal chips and cutting fluids abound—the Tri-Clad totally enclosed motor gives you more protection, *inside and out,* than any other make of motor you can buy.

1,720,000 Tri-Clad motors, operating in every conceivable kind of plant, prove the far-reaching advantages of cast-iron construction . . . superior resistance to corrosion . . . rigidity that makes for permanent shaft alignment . . . inherent damping action that minimizes noise and damaging vibration. These motors prove, too, that Tri-Clad double-end ventilation simply has no equal for prolonging an open motor's useful life. Providing high-volume, relatively low-velocity cooling, this ventilating system keeps Tri-Clad motors *uniformly* "air-conditioned".

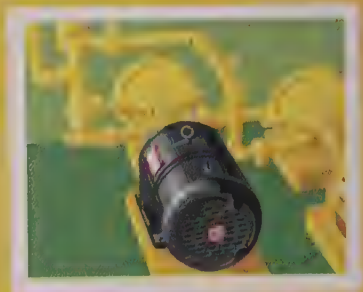
WANT MOTORS THAT CAN REALLY TAKE ABUSE? Tri-Clad motors in nearly all types and ratings are available for **IMMEDIATE SHIPMENT.** Contact your nearest G-E Office or write *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

GENERAL ELECTRIC

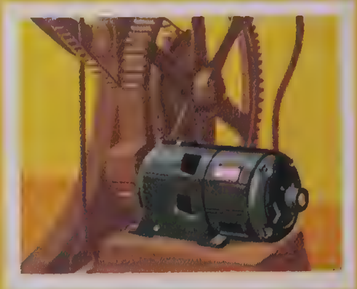
There's a Tri-Clad motor for every industrial need!



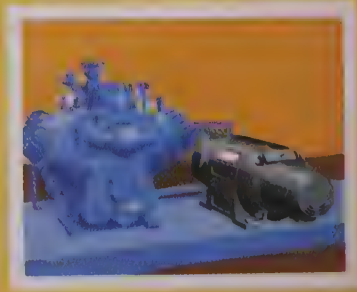
G-E open (dripproof) induction motors for constant-load, constant-speed applications. From 1 to 2000 hp.



G-E totally enclosed motors for outdoor operation, in abrasive dusts, or corrosive fumes. From 1 to 1000 hp.



G-E gear-motors for low-speed operation. A normal-speed motor with built-in reduction gear. From ⅛ to 75 hp.



G-E synchronous motors for maintaining exact speeds or for correcting power factor. From 20 to 1000 hp.

YOU CAN'T BEAT
TRI CLAD
REG. U.S. PAT. OFF.
EXTRA
PROTECTION

STANDARDS and SPECIALS by the Millions

THE FERRY CAP & SET SCREW CO.

2157 SCRANTON ROAD • • • CLEVELAND 13, OHIO

"SHINYHEADS"

America's Best Looking Cap Screw

Made of high carbon steel — AISI C-1038 — to standards for Full Finished hexagon head cap screws—bright finish. Heads machined top and bottom. Hexagon faces clean cut, smooth and true, mirror finish. Tensile strength 95,000-110,000 p.s.i. Carried in stock.

"HI-CARBS"

Heat Treated Black Satin Finish

Made of high carbon steel — AISI C-1038. Furnished with black satin finish due to double heat treatment. Hexagon heads die made, not machined. Points machine turned; flat and chamfered. Tensile strength 130,000-160,000 p.s.i. Carried in stock.

"LO-CARBS"

Made of AISI C-1018 steel—bright finish. For use where heat treatment is not required and where ordinary hexagon heads are satisfactory. Hexagon heads die made to size — not machined. Points machine turned. Tensile strength 75,000-95,000 p.s.i. Carried in stock.

SET SCREWS

Square head and headless — cup point. Case hardened. Expertly made by the pioneers in producing Cup Point Set Screws by the cold upset process. Cup points machine turned. Carried in stock.

FILLISTER CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

FLAT HEAD CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

"SHINYLAND" STUDS

All studs made steam-tight on tap end unless otherwise specified, with flat and chamfered machined point. Nut end, oval point. Land between threads shiny, bright, mirror finish. Carried in stock.

*

ADJUSTING SCREWS

Valve tappet adjusting screws — Hexagon head style — to blue print specifications—hexagon head hard; polished if specified — threads soft to close tolerance — points machine turned; flat and chamfered

*

CONNECTING ROD BOLTS

Made of alloy steel — heat treated — threads rolled or cut — finished to extremely close thread and body tolerances — body ground where specified. Expertly made by the pioneers in producing connecting rod bolts by the cold upset process.

*

SPRING BOLTS

Case hardened to proper depth and ground to close tolerances. Thread end annealed. Supplied in various head shapes, with oil holes and grooves of different kinds, and flats accurately milled.

FERRY PATENTED ACORN NUTS

For ornamental purposes. Steel insert — steel covered. Finish: plain, zinc plated, cadmium plated. Size: 9/16", 3/4", 15/16" across the flats.

Tapped 1/4" to 3/4" inclusive. Cross section of Ferry patented acorn nut, showing how steel hexagon nut fits snugly into shell.

Pioneers and Recognized Specialists, Cold Upset Screw Products since 1907

STANDARDS

carried by

LEADING

DISTRIBUTORS

*

SPECIALS

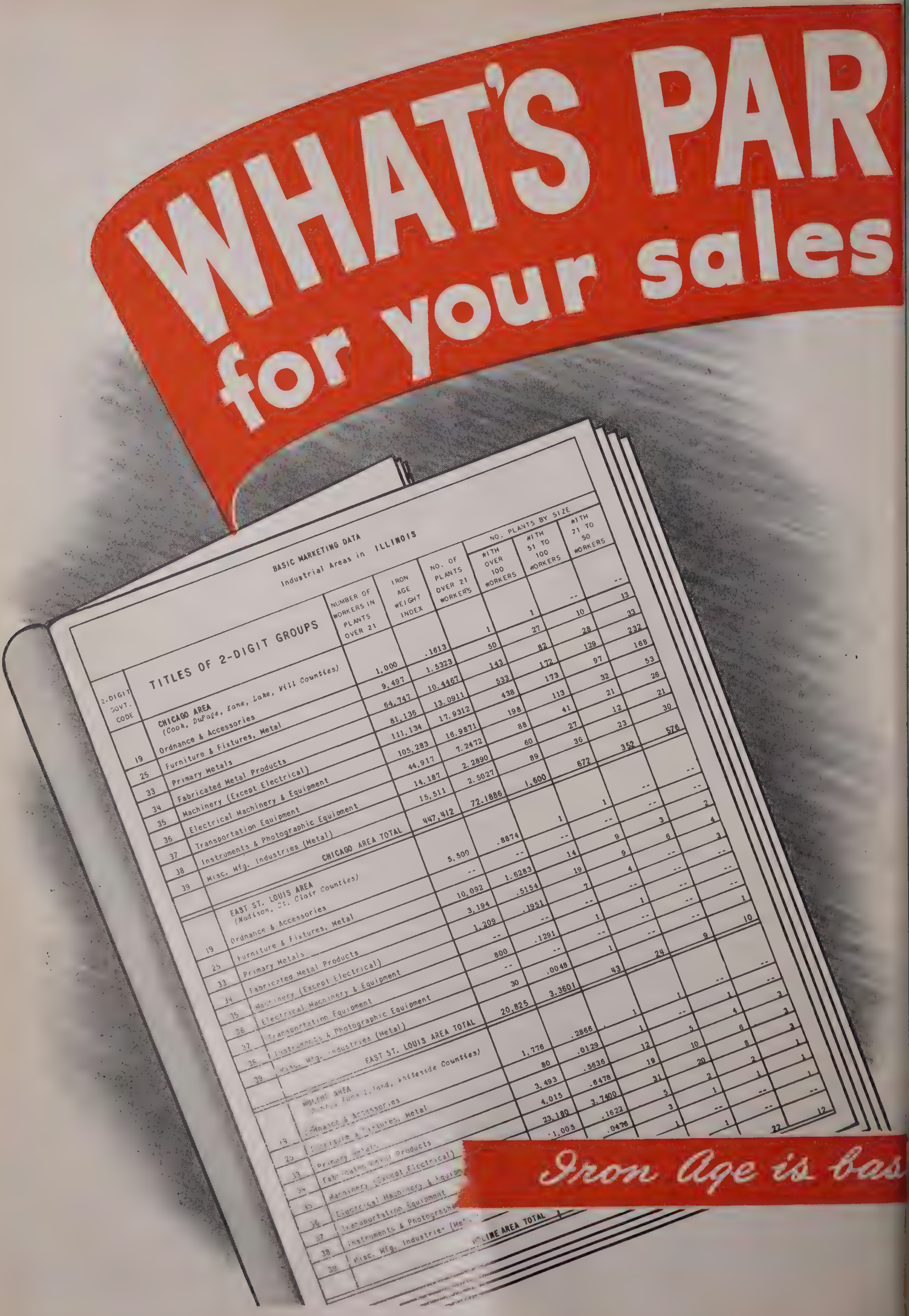
furnished to

BLUE PRINT

SPECIFICATIONS

WRITE FOR INFORMATION

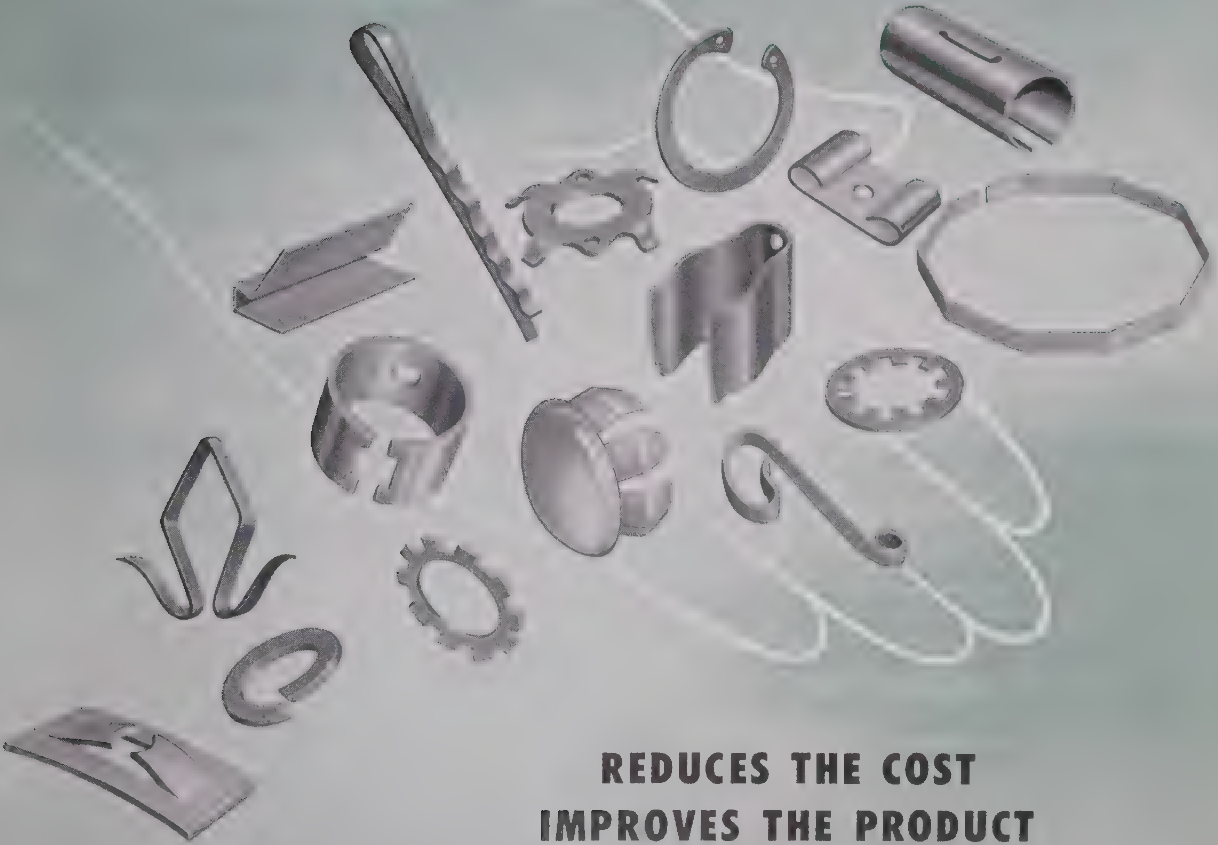
SEND FOR SAMPLES



BASIC MARKETING DATA
Industrial Areas in ILLINOIS

2-DIGIT GOVT. CODE	TITLES OF 2-DIGIT GROUPS	NUMBER OF WORKERS IN PLANTS OVER 21	IRON AGE WEIGHT INDEX	NO. OF PLANTS OVER 21 WORKERS	NO. PLANTS BY SIZE: WITH OVER 100 WORKERS	WITH 51 TO 100 WORKERS	WITH 21 TO 50 WORKERS
	CHICAGO AREA *(Cook, DuPage, Kane, Lake, Will Counties)*						
19	Ordnance & Accessories	1,000	.1613	1	1	--	--
25	Furniture & Fixtures, Metal	9,497	1.5323	50	27	10	13
33	Primary Metals	64,747	10.4467	143	82	28	33
34	Fabricated Metal Products	81,136	13.0911	533	172	129	232
35	Machinery (Except Electrical)	111,134	17.9312	438	173	97	168
36	Electrical Machinery & Equipment	105,283	16.9871	198	113	32	53
37	Transportation Equipment	44,917	7.2472	88	41	21	26
38	Instruments & Photographic Equipment	14,187	2.2890	60	27	12	21
39	Misc. Mfg. Industries (Metal)	15,511	2.5027	89	36	23	30
	CHICAGO AREA TOTAL	447,412	72.1886	1,600	672	352	576
	EAST ST. LOUIS AREA *(Madison, St. Clair Counties)*						
19	Ordnance & Accessories	5,500	.8874	1	1	--	--
25	Furniture & Fixtures, Metal	--	--	--	--	--	--
33	Primary Metals	10,092	1.6283	14	9	3	2
34	Fabricated Metal Products	3,194	.5154	19	9	6	4
35	Machinery (Except Electrical)	1,209	.1951	7	4	--	3
36	Electrical Machinery & Equipment	--	--	--	--	--	--
37	Transportation Equipment	800	.1291	1	1	--	--
38	Instruments & Photographic Equipment	--	--	--	--	--	--
39	Misc. Mfg. Industries (Metal)	30	.0048	1	--	--	1
	EAST ST. LOUIS AREA TOTAL	20,825	3.3601	43	24	9	10
	MOLINE AREA *([illegible], Rock Island, Whiteside Counties)*						
19	Ordnance & Accessories	1,776	.2866	1	1	--	--
25	Furniture & Fixtures, Metal	80	.0129	1	--	1	--
33	Primary Metals	3,493	.5636	12	5	4	3
34	Fabricated Metal Products	4,015	.6478	19	10	6	3
35	Machinery (Except Electrical)	23,180	3.7400	31	20	8	3
36	Electrical Machinery & Equipment	1,005	.1622	5	2	2	1
37	Transportation Equipment		.0476	3	1	1	1
38	Instruments & Photographic Equipment			1	--	--	1
39	Misc. Mfg. Industries (Metal)				1	--	--
	MOLINE AREA TOTAL					22	12

WEIRTON
HIGH-CARBON STRIP
COLD-ROLLED SPRING STEEL



REDUCES THE COST IMPROVES THE PRODUCT

Due to the consistent uniformity of Weirton high-carbon strip cold-rolled spring steel, cold forming or blanking is easier. It has met requirements for a variety of products where high fatigue-resistance is a principal factor.

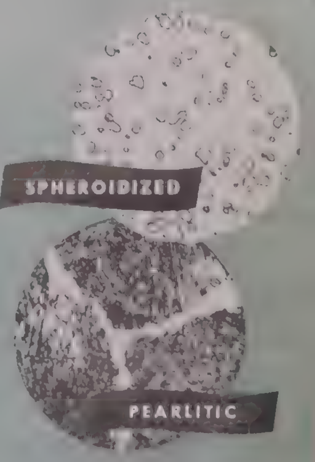
Where forming is required, Weirton supplies spheroidized-annealed cold-rolled spring steel to insure customers simple, economical fabrication. The controlled grain structure provides exceptional ductility for such a high carbon steel. Close technical control during manufacture insures those precise qualities you expect in a spring steel.

Where clean, economical blanking is required, Weirton supplies a product which is temper rolled to produce controlled ranges of hardness and tensile strength. The desired ranges are designed to meet the specific requirements of the customer's tool practice.

Weirton cold-rolled spring steel responds accurately to heat treatment after forming or blanking, has rigidly controlled chemical and physical properties, exact constancy of grain structure and controlled limits of decarburization. It has exceptional uniformity of gauge and width.

It is supplied with the desired chemical analysis and for specified heat treating and hardness ranges in strips up to 7 inches wide. Ask Weirton metallurgists to work with you in determining

SPHEROIDIZED FOR EASIER COLD-FORMING

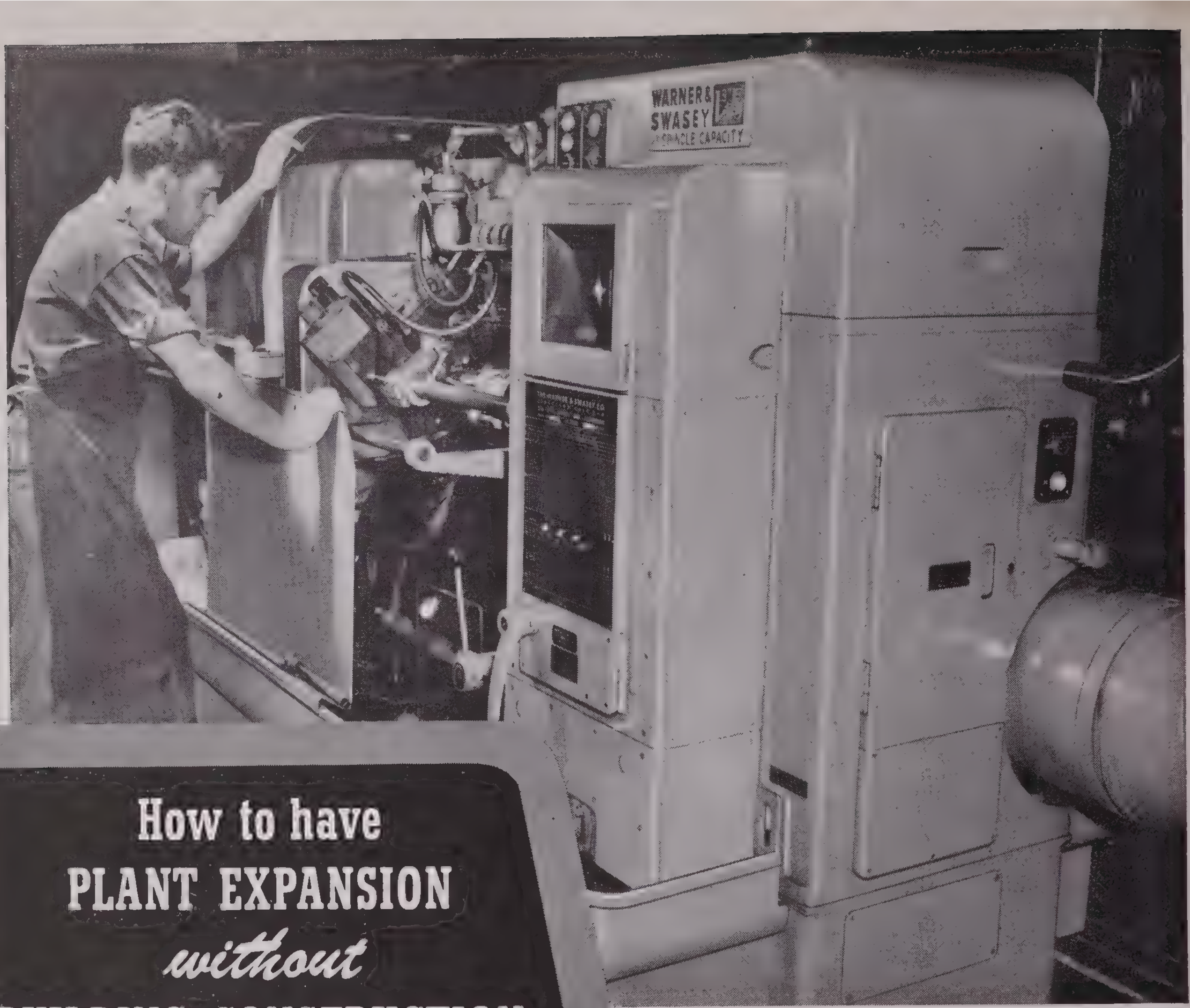


EIRTON STEEL CO.

WEIRTON, W. VA. • *Sales Offices in Principal Cities*

Division of **NATIONAL STEEL CORPORATION**

Executive Offices, Pittsburgh, Pa.



How to have PLANT EXPANSION *without* BUILDING CONSTRUCTION

Alloy Steel Products Co., Linden, N. J. *finds the answer in* WARNER & SWASEY AUTOMATICS

ALLOY STEEL PRODUCTS makes stainless steel valves for the chemical and oil industries. Production, limited to short runs, had been done profitably on turret lathes . . .

But now with *more* volume needed, there wasn't room for more lathes, and construction costs for plant expansion was prohibitive. Subcontracting was tried, but these costs threatened to throw selling prices out of line.

The new CAMLESS Warner & Swasey 5-Spindle Automatic provided a solution. On these machines short and medium runs are practical, and Alloy Steel Products Company handles 69 different jobs in lots of 200 to 500, *profitably* on this new type automatic.

No investment in cam stocks—no set-up man was needed!

Volume—better in quality and finish—stepped up to an all-over average increase of 50% without need for additional floor space.

It's simpler to set up a Warner & Swasey CAMLESS Automatic!

WARNER & SWASEY
Machine Tools
Cleveland

Turret Lathes, Multiple & Single Spindle Automatics, Precision Tapping and Threading Machines

YALE FORK TRUCK

YALE WORKSAVER

Move materials faster, safer and at a saving with
Battery Electric Trucks and EXIDE-IRONCLAD BATTERIES

Put battery electric trucks to work saving and earning for you. In thousands of plants, with material handling problems like yours, they are helping to boost production and cut costs. In fact, industrial management has found that materials handling is one of the few remaining fields where major economies can be effected.

Battery Electric Trucks can save time, manpower and money for you in loading and unloading cars and trucks . . . in handling materials in process . . . in hauling and tiering in warehouse . . . in *every* materials handling job from receiving to shipping. And for dependable, long-lasting power, equip your trucks with Exide-Ironclad Batteries, the batteries that assure full shift dependability, day after day, year after year.

Exide-Ironclad Batteries have ALL FOUR of the vital characteristics of an efficient storage battery—high power ability, high electrical efficiency, ruggedness and long life.

Write for further particulars and FREE copy of Exide-Ironclad Topics. It covers latest developments in materials handling and shows actual case histories.

DEPENDABLE

POWER

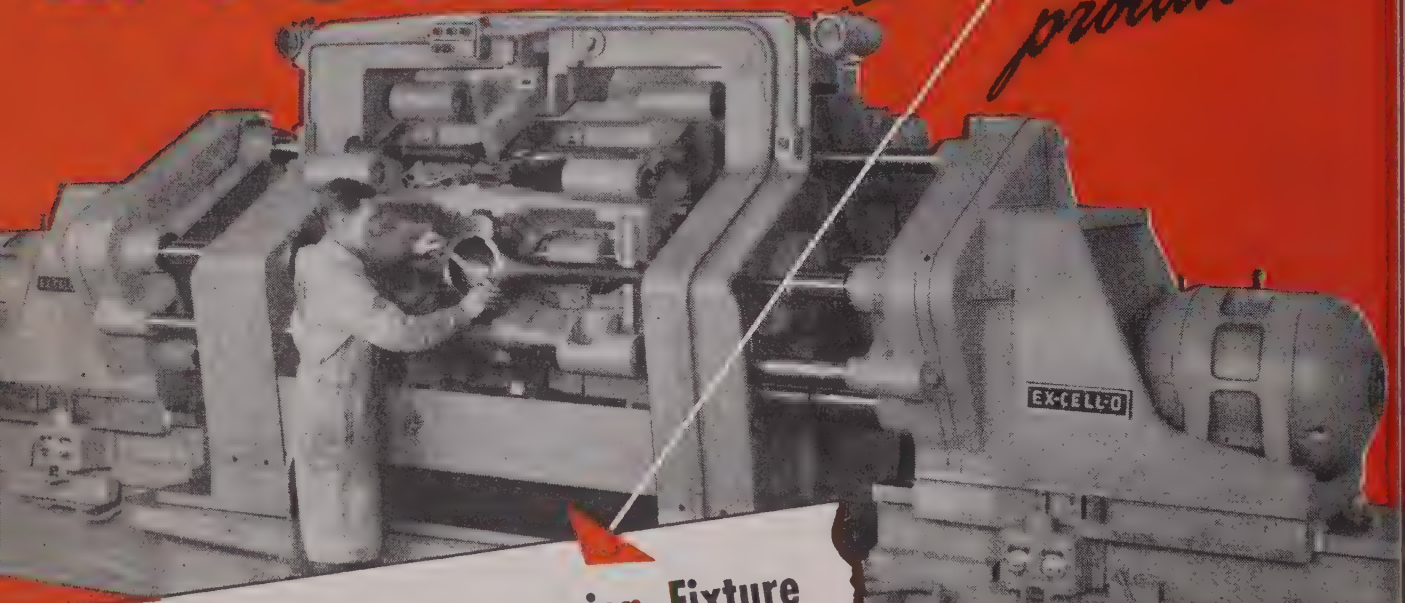
Exide
IRONCLAD

1888 . . . Dependable Batteries for 60 Years . . . 1948

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32 • *Exide Batteries of Canada, Limited, Toronto*

EX-CELL-O

Can give you more economical production



Special Machine with Trunnion Fixture Combines Operations on Axle Housings

Combining operations is a time-proven method of obtaining more economical production. Shown here is an Ex-Cell-O special machine with a six-station power indexing trunnion type fixture that performs roughing and finishing operations on steel axle housings. Standard hydraulically-actuated slides at both ends of the machine carry multiple spindle heads and their drive motors. Another slide at the rear supports a precision spindle and a facing head.

The tool holders in both the multiple spindle heads are rigidly guided by bushings in the fixture end frames. Coolant is manifolded to each station and directed through drilled holes to the point of contact between the tools and the work.

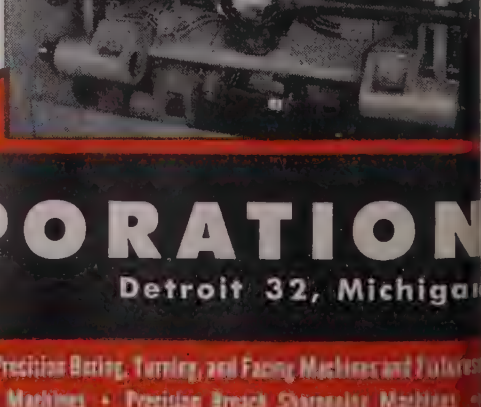
Parts are laid in the loading station and are located and clamped hydraulically. Operations are rough, semi-finish bore and ream bearing diameters at both ends; rough and finish face flanges, chamfer inside and outside edges of flanges and turn O.D. of flanges at both ends; face banjo. All these operations are performed at a net production rate of 55 pieces per hour!

Let Ex-Cell-O help you combine operations for more economical production. A complete staff of experienced machine tool engineers is ready to help you with your production problems. Contact your Ex-Cell-O representative today!

XLO
EX-CELL-O for PRECISION

Above: Ex-Cell-O special machine performs many operations on steel rear axle housings.

Below: Close-up view of the Ex-Cell-O six-station trunnion type fixture which easily handles the large parts.



EX-CELL-O CORPORATION

Detroit 32, Michiga

Special Multiple Way Type Precision Boring Machines • Special Multiple Precision Drilling Machines • Precision Boring, Turning, and Facing Machines and Fixtures • Precision Cylinder Boring Machines • Precision Thread Grinding Machines • Precision Lapping Machines • Precision Broach Sharpening Machines • Other Special Purpose Machines • Tool Grinders • Continental Cutting Tools • Broaches and Broach Fixtures • Counterbore Sets • Grinding • Hydraulic Power Units • Drill Jig Bushings • R.R. Pins and Bushings • Fuel Injection Equipment • Dairy Equipment •

YOU'RE SAFE WITH A *BROWNING*

LONG-BOOM CRANE

AN EXAMPLE
OF BROWNING
Proven
Design

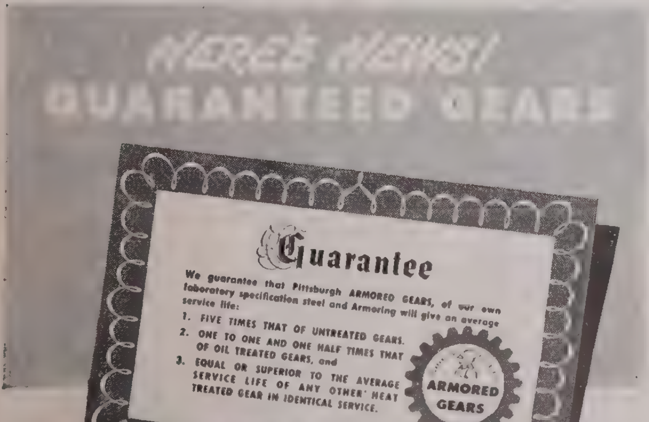
BOOM hoist safety should be the first concern of crane owners. The damage caused by a falling boom can be far more serious than that caused by dropping a load because the area in which the boom will land is much greater.

You're *safe* with a Browning because boom hoist safety is a major feature in every Browning built. The diesel locomotive crane has positive engage, automatic brake, extra hand brake. Truck, wagon and crawler cranes operate with the new multiple-pawl rachet and chain power *through the engine.* For "inching" the load there are two separate boom hoist clutches and, of course, the large brake.

Fast, *safe* boom hoist operation is another *Proven Design* feature of your Browning. Write for literature.

THE BROWNING
CRANE & SHOVEL CO.
16221 Waterloo Road
Cleveland 10, Ohio

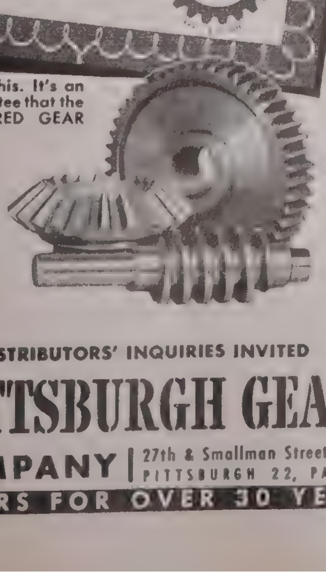
BROWNING
LOCOMOTIVE, WAGON,
TRUCK and TU-CONTROL
Cranes


HERE'S NEWS!
GUARANTEED GEARS
ARMORED
GEARS

Guarantee

We guarantee that Pittsburgh ARMORED GEARS, of our own laboratory specification steel and Armoring will give an average service life:

1. FIVE TIMES THAT OF UNTREATED GEARS.
2. ONE TO ONE AND ONE HALF TIMES THAT OF OIL TREATED GEARS, and
3. EQUAL OR SUPERIOR TO THE AVERAGE SERVICE LIFE OF ANY OTHER HEAT TREATED GEAR IN IDENTICAL SERVICE.



No idle promise, this. It's an unqualified guarantee that the Pittsburgh ARMORED GEAR Line will give you longer life than you have ever thought possible . . . to lower your gear maintenance costs and increase production by reducing time-consuming shutdowns. Tell us your requirements.

DISTRIBUTORS' INQUIRIES INVITED

PITTSBURGH GEAR COMPANY | 27th & Smallman Streets
PITTSBURGH 22, PA.

QUALITY GEARS FOR OVER 30 YEARS

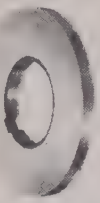
Made to *YOUR* Specifications

SPRINGS
STAMPINGS
WIRE FORMS

M. D. HUBBARD SPRING CO.

325 CENTRAL AVE. • PONTIAC 12, MICH.

COWLES



GANG SLITTING KNIVES

STANDARD for SERVICE and DURABILITY. Ground to extremely close Tolerances and Finish.
Made by TOOLMAKERS.

COWLES TOOL COMPANY
CLEVELAND 2, OHIO

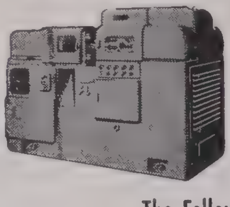
Hartford STEEL BALLS

A PRODUCT OF INGENIOUS MACHINERY AND SKILLED CONNECTICUT OPERATORS

STEEL, BRONZE, MONEL, STAINLESS STEEL AND ALL WORKABLE MATERIALS

Any Quantities

THE HARTFORD STEEL BALL CO. HARTFORD 6, CT



Fellows
LEOMINSTER
PLASTICS MOLDING MACHINES

The Fellows Gear Shaper Company, Springfield, Vermont

HAVING A METAL JOINING PROBLEM? Ask Us

Low Temperature **EUTECTIC** WELDRODS

"Eutectic Low Temperature Weldrods" can solve it for you the modern way by joining metals at low heat — avoiding distortion, stress, warping, overheating.

Over **100 ALLOYS** *to solve* **Gas or Arc WELDING BRAZING SOLDERING Hard Surfacing Fluxing** *problems*

Write to sole manufacturer —
EUTECTIC WELDING ALLOYS CORP. DEPT.—A
40 Worth Street New York 13, N. Y.
Chicago, Cincinnati, Cleveland, Dallas, Detroit, Los Angeles, San Francisco, etc.

160 Field Engineers Everywhere to Help You

America's Welding Alloy Specialists

SINCE 1832
Bradley

The name to remember for CUSHIONED POWER HAMMERS

C.C. BRADLEY & SON, INC. Syracuse, N.Y.

Zinc

STRIP, COILED
WIRE, COILED
ACCURATELY ROLLED FOR ELECTRIC FUSE ELEMENTS
EYELETS — BRASS, STEEL AND ZINC

THE PLATT BROS. & CO., WATERBURY, CONN.

EXPERIENCE

" . . . knowledge, skill or technique" . . . Webster.

Since 1883 — making quality stampings from steel, brass and aluminum—serving the country's leading industrial firms.

Send blueprints and samples for quotation.

WORCESTER STAMPED METAL CO.
Established 1883
10 HUNT STREET • WORCESTER, MASS.

HOT DIP GALVANIZING

SOUTHERN GALVANIZING CO.
BUSH STREET AND B.&O.R.R., BALTIMORE, MD.
Ideally located for export
LOW RAIL AND WATER RATES, EAST AND WEST

KESTER
SOLDERING
SALTS

KESTER FLUXES
PREFERRED SINCE 1899

KESTER SOLDER COMPANY
4215 Wrightwood Ave., Chicago 39, Ill.
Eastern Plant Newark, New Jersey • Canadian Plant: Brantford, Canada

P&H

OVERHEAD TRAVELING CRANES • AC and DC ARC WELDERS • WELDING ELECTRODES WELDING POSITIONERS • ELECTRIC HOISTS INDUSTRIAL CRAWLER CRANES

4401 W. National Ave., Milwaukee 14, Wis.

HARNISCHFEGER
CORPORATION
EXCAVATORS • ELECTRIC CRANES • ARC WELDERS P&H HOISTS • WELDING ELECTRODES • MOTORS

STAINLESS STEEL
—PERFORATED—
TO YOUR REQUIREMENTS
SEND US YOUR DRAWINGS FOR PRICE

PERFORATED METALS
FOR ALL INDUSTRIAL USES

ALL SIZE AND SHAPE HOLES—ALL METALS
ARCHITECTURAL GRILLES

DIAMOND MFG. CO.
BOX 28 *Write for Catalog 35* WYOMING, PA.

STANLEY STEEL
STEEL MAKERS SINCE 1871
HOT ROLLED COLD ROLLED SPECIAL CARBON ALLOYS

THE STANLEY WORKS
NEW BRITAIN, CONN. • BRIDGEPORT, CONN. • HAMILTON, ONTARIO

LOBDELL-NAZEL HAMMERS

Type illustrated can be worked by one man . . . are ideal for general maintenance, blacksmithing and similar applications. Write for Hammer Book—it gives their many advantages in detail.

BASE and ANVIL ARE CAST IN ONE PIECE

LOBDELL NAZEL FORGING HAMMERS

PAPER MILL MACHINERY
FORGING HAMMERS

DILL "T-H" SLOTTERS
ROLLS FOR ALL INDUSTRIES

LOBDELL COMPANY ESTABLISHED 1836 **WILMINGTON 99, DEL.**

FURNACE ENGINEERS, INC.

FURNACES
FOR THE
STEEL INDUSTRY

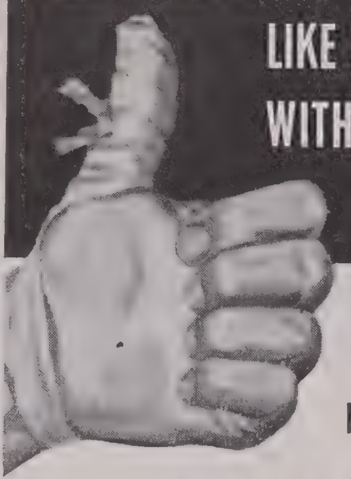
F.E.I.

1551 W. LIBERTY AVE. PITTSBURGH 26, PA.

Specialists in Blast Furnace and All Types of Firebrick Construction Work

A. E. ANDERSON
CONSTRUCTION CORPORATION
1720 MILITARY ROAD
P. O. BOX STATION B, BOX 36, BUFFALO, N. Y.

WILL YOUR FASTENERS STICK OUT LIKE A SORE THUMB WITHIN 6 MONTHS ?



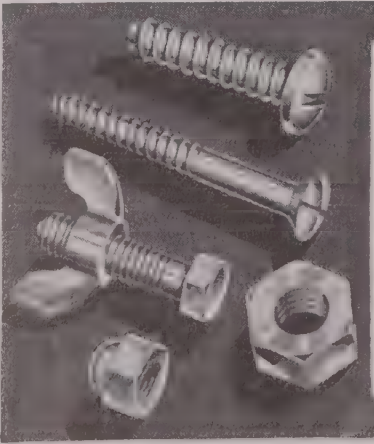
NOT WHEN YOU

FASTEN ALUMINUM

WITH ALUMINUM

Alcoa Fasteners for aluminum assemblies prevent that sore thumb look that results when galvanic action attacks dissimilar metals and causes corrosion, or when red rust attacks. Alcoa Aluminum Fasteners come bright and stay bright—dress up your aluminum assemblies.

Complete selection—wood, sheet metal and machine screws in a range of types and sizes; washers; hex head bolts; hex, cap, wing and castle nuts, all in standard sizes and threads. Aluminum Company of America, 616 Gulf Building, Pittsburgh 19, Pennsylvania.



FREE!
SAMPLES OF ALUMINUM FASTENERS
Samples of Alcoa Aluminum Fasteners sent free when you request them on your letterhead. Please specify type and size you prefer.

ALCOA®

ALCOA *Aluminum* FASTENERS

CHICAGO
STEEL PRESS BRAKES
and
HAND *and* POWER BENDING BRAKES
and
DIES FOR ALL STANDARD
MODERN PRESS BRAKES

DREIS & KRUMP MFG. CO.
7430 LOOMIS BLVD • CHICAGO 36, ILLINOIS
World's Largest Makers of Steel Press Brakes—
Hand and Power Bending Brakes

"NEWARK GEAR"

Gear Cutting Machines

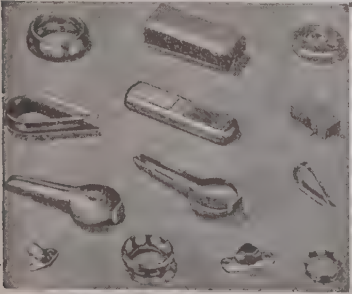
•

NEWARK GEAR CUTTING MACHINE CO.
69 Prospect St., Newark, N. J.

THE
TORRINGTON
ROTARY
SWAGING MACHINE

— with 4000 forceful squeezing hammer blows per minute—makes metal tougher and more elastic. Send for booklet—"The Torrington Swaging Machine."

The Torrington Co., Swager Dept.
56 Field Street
Torrington, Conn.



Over 20 years Experience

DIES and STAMPINGS

BUS and TRAILER PARTS

- **Send Us Your Blue Prints and Specifications**

THE H AND P DIE and STAMPING CO
13943 TRISKETT ROAD • CLEVELAND 11, OHIO

THE BELMONT IRON WORKS
Structural Steel — Buildings & Bridges
Riveted — Arc Welded
Cable Address — Bellron
Engineers — Fabricators — Erectors — Contractors — Exporters
SHOPS: PHILADELPHIA—EDDYSTONE—ROYERSFORD
Main Office: Phila. 46, Pa.
New York Office: 44 Whitehall St., N. Y. 4, N. Y.

ATLANTIC STEEL PRODUCTS CO.
1330 N. 30th St., Philadelphia 21, Pa.
From Stock
BARS · STRIP · SHEETS · PLATES

PRESSES
FEEDS
AUTOMATIC EQUIPMENT
The
V & O PRESS COMPANY
HUDSON, NEW YORK

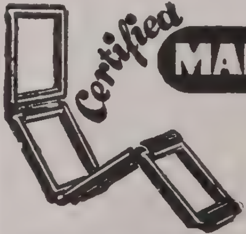
Famous for

- ACCURACY OF THREADS
- LOW CHASER COST
- ALL AROUND DEPENDABILITY

Bulletins available: General Purpose Die Heads. Insert Chaser Die Head. Threading Machines.

See our Adv. on page 221 Nov. 4 Iron Age

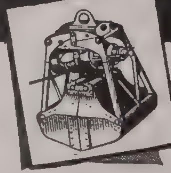
THE EASTERN MACHINE SCREW CORP., 21-41 Barclay St., New Haven, Conn. Pacific Coast Representative: *A. C. Berhringer, 334 N. San Pedro Street, Los Angeles, California.* Canada: *F. F. Barber Machinery Co., Toronto, Canada.*



Certified **MALLEABLE IRON** *Castings*

Detachable and Riveted Sprocket Chain, Malleable Washers, Tank Lugs, Oarlocks. Catalogues on request.

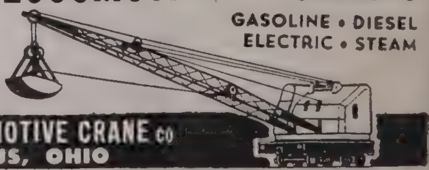
PEORIA MALLEABLE CASTINGS CO.
PEORIA, ILLINOIS, U. S. A.



HAYWARD BUCKETS

Use this Electric Motor Clam Shell for rehandling bulk materials in Industrial Plants.

THE HAYWARD CO., 40-50 Church St., N.Y.



OHIO LOCOMOTIVE CRANES
GASOLINE • DIESEL
ELECTRIC • STEAM

25 TO 40 TON CAPACITY

THE OHIO LOCOMOTIVE CRANE CO
BUCYRUS, OHIO

THE INTERNATIONAL HARDNESS SCALES
(BRINELL-SHORE)

are included in Our Improved Portable Scleroscope Model D-1. This efficient Single Scale tester registers Brinell-Shore values under otherwise inaccessible conditions. 100% portable for floor and field work, dead soft metals or superhard steel either of brittle or thin cross sections, non-destructive, accurate, speedy, always ready and fool-proof.

Send for Interesting Technical Bulletin and Prices.

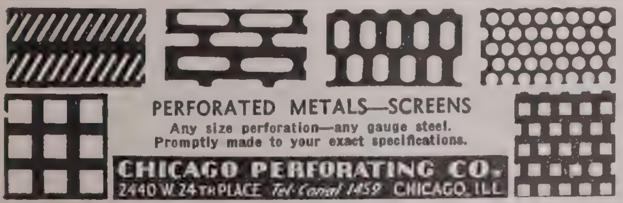
THE SHORE INSTRUMENT & MFG. CO., INC.
9025 Van Wyck Ave., Jamaica, N. Y.

PRODUCERS OF
Hot Rolled
Small Merchant BARS - Bar Size SHAPES
BOIARDI STEEL CORPORATION
300 Lower Market St. Milton, Pennsylvania

WETHERELL BROS. CO. STEEL ESTABLISHED 1870
WETHERELL BROS. CO.
251 Albany St., Cambridge, Mass.
C. R. Strip Stainless Steel
Tool Steel O. H. Specialties

WILLIAMS
DROP-FORGINGS
ANY SHAPE • ANY MATERIAL • COMPLETE FACILITIES
Write for Free Forging Data Folder . . . Helpful, Informative
J. H. WILLIAMS & CO., "The Drop-Forging People" BUFFALO 7, N.Y.

Have It Galvanized by—
JOSEPH P. CATTIE & BROS., INC.
Gaul & Letterly Sts., Philadelphia 25, Pa.
Philadelphia's Oldest, The Country's Largest
Hot Dip Job Galvanizer • Galvanized Products Furnished
Pickling and Oiling



PERFORATED METALS—SCREENS
Any size perforation—any gauge steel.
Promptly made to your exact specifications.
CHICAGO PERFORATING CO.
2440 W. 24TH PLACE Tel. Canal 1459 CHICAGO, ILL.

READ
THE
ADVERTISING
PAGES
• Equipment
• Materials
• Services
Sources for every need in the Metalworking industry.
THE IRON AGE

WHO... makes precision "milled from the bar" screw machine products that stand up under hard usage . . . and build up sales through customer demand?
Wm H. Ottemiller Co., YORK, PA. of course!
Write today for the new eye-catching folder that illustrates and describes our famous line of . . .
CAP SCREWS • SET SCREWS • COUPLING BOLTS
and MILLED STUDS in all sizes and threads

WEBB WIRE
STRENGTH UNIFORMITY DURABILITY REG. U.S. PAT. OFF.
NEEDLE
and
STAINLESS
THE WEBB WIRE WORKS
NEW BRUNSWICK, N. J.
PHONE 2-4668-9

METAL STAMPINGS · WIRE FORMS
Just a few of the more than 7000 catalog items we manufacture.
What do YOU need?
EASTERN TOOL & MFG. CO.
General Office BELLEVILLE 9, N. J.

PERFORATED METALS for Every Purpose

Write for New Catalog of Patterns
Steel, Brass, Copper, Monel, Bronze, Aluminum, Zinc, Lead, Stainless Steel and all metals or materials punched as required and for all kinds of screens.
We can guarantee perfectly flat sheets free from buckles and camber.
CHARLES MUNDT & SONS
59 FAIRMOUNT AVENUE JERSEY CITY, N. J.

pennsteel
pennsteel
pennsteel
SINCE 1903
PENNSYLVANIA IRON AND STEEL COMPANY
TURNINGS
TURNINGS
TURNINGS

Always Buying
TURNINGS
for our Crusher
37th & A.V.R.R. PITTSBURGH 1, PA.

GRIFFIN

COLD ROLLED STRIP STEEL
1/2" TO 19" WIDE
.002" TO .500" THICK
Depending on the width, within commercial practice
DESIRED QUALITY FOR FORMING AND DRAWING—
GRIFFIN MFG. CO.
ERIE PENNA

SALES AGENTS

NEW YORK CITY—Wm. H. Leonori & Co., Inc., 30 Howard St.

CHICAGO—Central Steel & Wire Co., 3000 West 51st St.

DETROIT—D. S. Wegener, Boulevard Bldg., 7310 Woodward Ave.

BUFFALO—J. J. Lambert, 328 Huntingdon Ave.

CINCINNATI 14—Central Steel & Wire Co., Box 148 Annex Station.

SAN FRANCISCO—Charles L. Lewis, 703 Market St.

THE **KING PORTABLE BRINELL**

A hardness tester particularly adapted for use on CASTINGS and FORGINGS

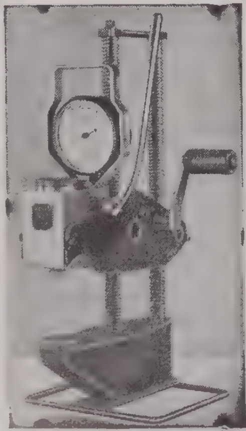
Puts an actual load of 3000kg on a 10mm ball.
Throat, 4" deep.
Gap, 10" high.
Weight, 26 lbs.

Can be used in any position—even upside down.

Equally accurate as portable or stationary equipment.

Test head removable for testing larger pieces beyond the capacity of the standard base.

ANDREW KING
524 Broad Acres Rd., Narberth, Penna.



Make a Time Study
OF
NICHOLSON EXPANDING MANDRELS

Time studies show that, with these widely used precision tools, operations can frequently be completed in less time than was formerly consumed in locating or turning a solid arbor. Set of 14 does work of 209 solid arbors. Two types Sold singly or in sets; for bores ½" to 7". BULLETIN 1043.

W. H. NICHOLSON & CO., 165 Oregon St., Wilkes-Barre, Pa.

Cutting Off Machines for Sawing All Kinds of Metals

THE ESPEN-LUCAS MACHINE WORKS
FRONT AND GIRARD AVE., PHILADELPHIA, PENNA.

MICHIANA PRODUCTS CORP.
MICHIANA
See Display Ad in November 11th Issue
HEAT- and CORROSION-RESISTANT ALLOYS
MICHIGAN CITY, INDIANA

WIRE AND METAL RIBBON
FORMING MACHINERY
NILSON TILTING
WIRE REELS
(Wire Reel Catalog No. 51)
Special Machines Designed and Built to Order
THE A. H. NILSON MACHINE COMPANY BRIDGEPORT, CONN.

STEEL from STOCK
BARS • STRUCTURALS • PLATES
SHEETS • COLD FINISHED • ETC.
Write for Monthly Stock List
AMERICAN PETROMETAL CORP.
BROADWAY AT 11th ST., LONG ISLAND CITY 2, N. Y.

LELAND-GIFFORD COMPANY
Worcester, Mass.
Drilling Machinery
Belt and Motor Spindle
One to Six Spindles
Tapping Attachments and Multiple Heads

GOSS and DE LEEUW
MULTIPLE SPINDLE
CHUCKING MACHINES
Four, Five, Six, Eight Spindles • Work and Tool Rotating Type
GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

THE CLEVELAND STEEL TOOL CO.
Punches, Dies, Chisels, Rivet Sets
660 E. 82^{D} St. Cleveland, O.
If it's RIVETED you KNOW it's safe

(THIS SPACE RESERVED)

For wide-awake manufacturer who may be up to his neck in orders now, but who has an eye to his future business. A message every week in this advertising space keeps your name before those customers who would like to buy from you now. *The Iron Age.*

CONSIDER GOOD USED EQUIPMENT FIRST

AIR COMPRESSOR

210 cu ft Schramm Model 210 4½"x4¾" 6-Cylinder. V-Belt Pulley Drive including 50 HP AC Motor. 100# Press.
150 cu. ft. Worthington 2-Stage V-Belt Drive With 3 H.P. G.E. Motor 125# Pressure
315 cu. ft. Model RXI LeRoi Portable Air Compressor With 125 H.P. Gasoline Engine
1300 cu. ft. Ingersoll-Rand 2-stage, Motor Dr. With 312 H.P. G.E. Synchronous Motor

ANGLE BENDING ROLL

4x4x½" BERTSCH Angle Bending Roll, M.D.

BENDING ROLLS

10' Kling Pyramid Type Bending Roll, Motor Dr. Capacity ½" Mild Steel
12' Hilles & Jones Pyramid Type Bending Roll, Capacity 12" x ⅜" or 10' x ½" Belt Driven
14' Bertsch Initial Type Bending Roll, Rolls 9½" Diameter, Belt Driven

BRAKE—PRESS TYPE

12' x 3/16" All Steel Press Brake, Motor Driven

BUILDING

76' x 356' Steel Building—New, never erected

CRANES—GANTRY

10 ton Milwaukee 33' Span 440/3/60 AC
15 ton Harnischfeger 27' Span 230 Volt DC

CRANES—OVERHEAD ELECTRIC TRAVELING

2 ton Shepard-Niles	28' Span 550/3/60 AC.
2 ton Shepard-Niles	36' Span 550/3/60 AC.
3 ton Shepard-Niles	29' Span 550/3/60 AC.
3 ton P & H	37'6" Span 440/3/60 AC.
5 ton Shepard-Niles	27'3" Span 230 Volt DC.
5 ton Wright	47' Span 440/3/60 AC.
5 ton Shepard-Niles	40' Span 230 Volt DC.
5 ton Wright	47' Span 440/3/60 AC.
5 ton Northern	60' Span 220/440 AC.
6 ton P & H	60' Span 230 Volt DC
10 ton Wright	22'4" Span 440 Volt AC.
10 ton Morgan	47'8" Span 230 Volt DC.
20 ton P & H	50' Span 220/3/60 AC.

200 ton ALLIANCE Overhead Electric
Traveling Crane 100' Span
25 ton Auxiliary Hoist
Five 230 Volt DC Motors

5 Ton Shaw Crane 50' Span
Three Motors 440/3/60 A.C.
30 ton Shaw Crane 55' Span
With 5 Ton Auxiliary
Four Motors 440/3/60 A.C.

DIEING MACHINES

25 ton Henry & Wright Dieing Machine Double Roll Feed, Scrap Cutter 2" Stroke
75 ton Henry & Wright Dieing Machine Double Roll Feed, 6" Stroke, Motor Driven

DRAW BENCHES

50,000# Aetna Standard Single Chain Draw Bench 50' Draw. Complete with hydraulic system and electrical equipment
50,000# Aetna Standard Double Chain Draw Bench 30' Draw. Both Complete with Elecl. Equipment

FORGING MACHINES

1¼" Pawtucket Bolt Forging Machine
3", 3½", 4" Ajax
3", 4", 5", 6", 7½" National
4" Acme Model XN

FURNACES

1½ Ton Moore Type "Q" Lectromelt Furnace Complete with Transformer Equipment
2 Ton Heroult Nose Tilt Type Melting Furnace
3 Ton Heroult Rocker Tilt Type Melting Furnace
6 ton Moore Type OT Lectromelt Furnace
500# Electric Furnace Co. Tilting Type Rotary Gas Furnace. Complete with Accessories

GEAR HOBBING MACHINES

No. 5B Sykes Gear Generator, Motor Driven. Will cut a gear from 3" to 61" dia. by 48" wide on spur and 21" on Herringbone. New 1945
No. 120-H Gould & Eberhardt Universal Gear Hobbing Machine, Capacity Spur Gears up to 144" Dia., Helical Gears up to 120" Dia. Complete with Electrical Equipment

GEAR REDUCERS

600 H.P. Westinghouse Reduction Unit Ratio 3:76-1
500 H.P. Mesta Double Reduction Ratio 11:1
600 H.P. Falk Single Herringbone Gear Reducer, 366/40 RPM
1000 H.P. Falk Double Reduction Ratio 29:1

HAMMERS—BOARD DROP

1000# Billings & Spencer Model D
2000#, 4000# Chambersburg Model F
2500# Erie

HAMMERS—STEAM DROP

1000 lb. Chambersburg and Erie
1500# Erie
2000# Erie

HAMMERS—STEAM FORGING

800# Lane Single Frame
1000, 1250, 1500, 1600, 4000# Chambersburg
800, 900, 1000, 1250, 2500, 4500# Niles-Bement-Pond
1100, 1500, 1600# Erie Single Frame
20,000# Arch Type
8000# Morgan

HAMMERS—MISCELLANEOUS

1000# Chambersburg Pneumatic Motor Driven Forging Hammer, Complete with Motor
48" x 48" Chambersburg CecoStamp Hammer
48" x 36" Chambersburg CecoStamp Hammer
30" x 24" Chambersburg CecoStamp Hammer

LOCOMOTIVE—GASOLINE

35 ton Plymouth Model ML-8 Type 0-4-0 Gasoline Locomotive, Standard Gauge New 1943

MILLING MACHINES—PLANER TYPE

Ingersoll Slab Milling Machine, 26" wide x 30" height between housings, Tablo 30" x 20'
Ingersoll Slab Milling Machine, 42" wide x 30" height between housings, Table 48" x 20'

NIBBLER

No. 10-B Gray Turret Head Metal Nibbler Motor Driven, 36" Throat. Capacity mild steel 9/16". Complete with Circle Cutting Attachment

PLANERS

36"x36"x8' Cincinnati Hypro Planer, Motor Dr.
36"x30"x10' Cincinnati Planer, Motor Driven
32"x35"x10' Niles Tool Works Planer, Motor Dr.
84"x84"x40' Planer, Two Rail & 2 Side Heads
120"x120"x20' Planer, Two Rail & 2 Side Heads

PLANER—OPEN SIDE

36"x36"x8' Detrick & Harvey, Belt Driven

POLISHING MACHINE

No. 101 Production Machine Co. Polishing Machines (3 in tandem). Complete with Centerless Belt Feed & Wheel Truing Unit. Complete with Elec. Equip. & Accessories

PRESSES—HYDRAULIC

150 ton HPM Hydraulic Press. 48" Stroke 30" x 30" Platen
300 ton HPM Hydraulic Press, Complete with Pump & Motor, Bed Area 30" x 36", Stroke 18", Daylight 24"
600 ton Hydraulic Extrusion Press, 35½" Stroke, 29" x 26" Platen Size
700 Ton Robertson Hydraulic Extrusion Press, Complete with Pump & Motor
750 ton Lake Erie Double Acting Hydraulic Press, Platen 146" x 81½", Stroke 46"
1000 ton Chambersburg 4-Column, Hydraulic Press, 18" Stroke, 48" x 22" Between Columns
2000 ton Wood Hydraulic Press, 9" Stroke, 24" x 35" Bed Area
4000 ton Steam Hydraulic Forging Press, 128" x 64" Between Columns, Single Stroke 7", Total Stroke 80", Complete with Accessories

PRESS—HYDRAULIC WHEEL

400 ton Chambersburg Hydraulic Wheel Press, Motor Drive

STRAIGHTENERS AND BAR TURNING MACHINES

Type "A" Medart-Brightman Bar Turning Machine, MD. Capacity 1" to 4" diameter
Type "B" Medart-Brightman Bar Turning Machine M.D. Capacity 3" to 6" diameter
⅜" Shuster Straighteing & Cut-Off Machine Motor Driven. With 16' Cut-Off
⅝" Wells Straightening & Cut-Off Machine Motor Driven. With 20' Cut-Off
⅝" Wells Roller Type Straightening & Cut-Off Machine, Arr. M.D. With 22' Cut-Off
No. 5 Kane & Roach Straightener, Belt Drive, Capacity Angles 4x4x½", Rounds & Squares 2½", Flats 3½"x1"

PRESS—KNUCKLE JOINT

No. K-1200-30 Clearing Knuckle Joint Press 200 Ton Capacity 4" Stroke, 31" Between Uprights
No. 24K Bliss Knuckle Joint Press 400 Ton, 4" Stroke, 20 x 20" Bed Area

PRESSES—STRAIGHT SIDE

#87 Bliss Reducing Press, V-Belt Motor Drive 16" Stroke, 26" Between Uprights
300 ton Bliss Press Single Crank Double Geared 10" Stroke, 40¼" x 33½" Bed Area
#306½ Bliss Press, Motor Driven, 7" Stroke, Bed Area 27" x 27
#305 Bliss Press, Motor Driven 12" Stroke, Bed Area 24" x 24"
Ferracute Straight Side Punch Press, 100 Ton, 3" Stroke, 45 x 36" Bed Area
M & S Straight Side Punch Press, 37 Ton, 5½" Stroke, 15 x 15" Bed Area

PRESS—TOGGLE DRAWING

No. 185 Toledo 1400 ton Single Crank Press, 26" Stroke of Plunger, 18" Stroke of Blank-holder, Bed Area 72" x 72"

PUMP—VERTICAL TRIPLEX

2⅝" x 8" Aldrich Vertical Triplex Pump, Capacity 37 GPM at 1500 lbs. Pressure

PUNCH—BEAM

Size B Long & Allstatter Beam Punch & Coping Machine. Capacity to punch 2 or more holes in flanges or 6 or 8 holes in web of 24" and smaller beams, and cope sections of same size and smaller beams, channels, etc.

PUNCH—HORIZONTAL

No. 1 Hilles & Jones Horizontal Punch, Capacity ⅞" thru ¾"

PUNCH & SHEAR COMBINATIONS

Style G Cleveland Punch & Shear Double End 48" Throat, Capacity Punch 2" Thru 1"
Style G Cleveland Punch & Shear Single End 60" Throat, Capacity Punch 2" thru 1" plate
Style EF Cleveland Double End Bar & Angle Shear Motor Driven, Completely Equipped. NEW 1947
Style EF Cleveland single end arranged or geared Motor Drive. 72" Throat Capacity Punch 1¼" thru 1"
No. 48 Buffalo Armor Plate Single End Punch & Shear, Direct Motor Drive. Capacity Punch 1⅜" x 1", Shear 2" Rd. 1¾" Sq.
No. 2 Long & Allstatter Double End Throats 60" and 42". Capacity Punch 1" thru 1"

PUNCH—MULTIPLE

Size G Long & Allstatter Multiple Punch, Motor Driven 8'6" Between Housings, Complete with Spacing Table Automatic Spacing Indicator & Automatic Table Adjustment

RIVETERS

Chambersburg Engr. Co. Hydraulic Riveter 10'6", Standard Riveting Attachments
125 ton Hanna Bull Riveter, 75" Reach, 24" Gap, Capacity 1" Rivet Cold & 1½" Hot

ROLLING MILLS

3 x 5½" Ruesch Three High Mill
4 x 7" Standard Single Stand Two High
8 x 4½" McWilliams Single Stand Two High
10 x 12" Cold Rolling Mill 3 Stand 2 High
12 x 24" Waterbury Farrel Single Stand Two High
18" x 30" Farrel Two Stand Two High
20" x 30 Mesta Single Stand Two High
20 x 36 Farrel 2 Stand 2 High
20 x 40" Mackintosh Cold Reduction Mill
20 x 42" Waterbury Farrel Single Stand Two High
9" Two High Hot Mill for rolling strip steel

ROLLS—PLATE STRAIGHTENING

98" Hilles & Jones Plate Straightening Roll 6 Rolls 11" Dia. Capacity 1" Plate
No. 4 Hilles & Jones Plate Straightening Roll, Motor Driven, 6 Roll 14" Dia. x 10'4" Wide, Capacity 1" Mild Steel
No. 2B Kane & Roach Straightener, Motor Drive 13 Rolls 8½" Diameter

ROLLS—TAPER FORGING

#1 Ajax Taper Forging Roll, Motor Drive
#5 Ajax Taper Forging Roll, Motor Drive

SAWS

Z-36 Do-All Zephyr Saw, Motor Driven—36" Throat 36" Work Table—New 1947
42" Newton Type U-82-A Heavy Duty High Speed Cold Saw, Completely Hydraulic, Elecl. Equipment Included. Capacity 16" Round or Square with 48" Blade
AVEY Band Saw, Motor Driven Capacity 6" Round or Square

SHEARS—ALLIGATOR

No. 1½ Doelger & Kirsten Alligator Shear Motor Driven. Capacity 2" Round
No. 2 Doelger & Kirsten Alligator Shear Motor Driven. Capacity 3" Round
No. 3 Doelger & Kirsten Alligator Shear, Motor Driven. Capacity 4" Round, 3½" Square

SHEARS—ANGLE

No. 3 Hilles & Jones Double Angle Shear, Capacity 6 x 6 x 1", Motor Driven

SHEAR—BAR

No. 1 Long & Allstatter Bar Shear, Motor Driven, Capacity 2" Round, 1¾" Square

SHEAR—BILLET

No. 6 Mesta Billet Shear, Motor Driven, Capacity 6" x 6" Square Billets

SHEARS—GATE

8' x 1" Cincinnati Gate Shear, Motor Dr.
9' x ¾" Bertsch Gate Shear, Arr. M.D.
120" Morgan Gate Shear, Motor Driven, Hydraulic Holddowns, Complete with pump and motor. Capacity 1½" Mild Steel

SHEARS—ROTARY

No. 50 Quickwork Rotary Shear, Motor Drive, Capacity ¾" Mild Steel
No. 250 Kling Rotary Shear, Arr. Motor Drive, 36" Throat Capacity ¼" Plate
No. 500 Kling Rotary Shear, Motor Driven, Capacity ½", Complete with circle cutting, flanging and joggling attachments

SHEARS—SQUARING

13' x ⅜" Dreis & Krump All Steel
10' x ⅛" Niagara Overdriven Shear
8' x 5/16" Thomas Squaring Shear, Motor Drive

SLITTERS

Yoder GH-36 Gang Slitter & Leveling Machine, Capacity 4 cuts ¾" to 13 cuts 3/16", 8 Leveling Rolls 44" x 5" Dia. Motor Drive
30" Torrington Slitter, Arr. Motor Drive. Capacity 4 cuts .400" Gauge 30" wide
#621 Torrington 48" Slitter, Arr. Motor Drive with Slip Clutch Recoiler

STRAIGHTENERS

No. 4 Medart Straightening Machine, Arranged for Motor Drive. Capacity 2½" to 6" Incl. Round Bars
No. 4 Sutton Straightening Machine, Motor Drive, Capacity 2" to 6" Round. Timken equipped
Kane & Roach Rotary Straightener, Capacity ½" O.D. and smaller

SWAGING MACHINES

#112 Etna Machine Co. Rotary Swager, Arr. M.D.—Capacity Tubing 4", Die Length 18"—New 1945
No. 811S Langeller Swaging Machine, M.D., Capacity 6½" Tubes, 4½" Solids, Hot
Waterbury Farrel Triple Die Swaging Machine, Capacity Tubes ½" to 4", Motor Driven

TESTING MACHINES

10,000# Amsler Hydraulic Universal Testing Machine
60,000# Biehle Universal Hydraulic
200,000# Elmes Compression Testing Machine, Hydraulic Type
800,000# Hydraulic Chain Testing Machine

WELDER

Union Melt Type "U" Model CM21 Welder 1000 Amp. Transformer, Capacity up to ⅝" in stainless steel

• Manufacturing **RITTERBUSH & COMPANY, INC.** Equipment •
50 CHURCH ST., NEW YORK CITY, 7
Telephone Cortlandt 7-3437-3438

Confidential Certified Appraisals
Liquidations—Bona Fide Auction Sales Arranged

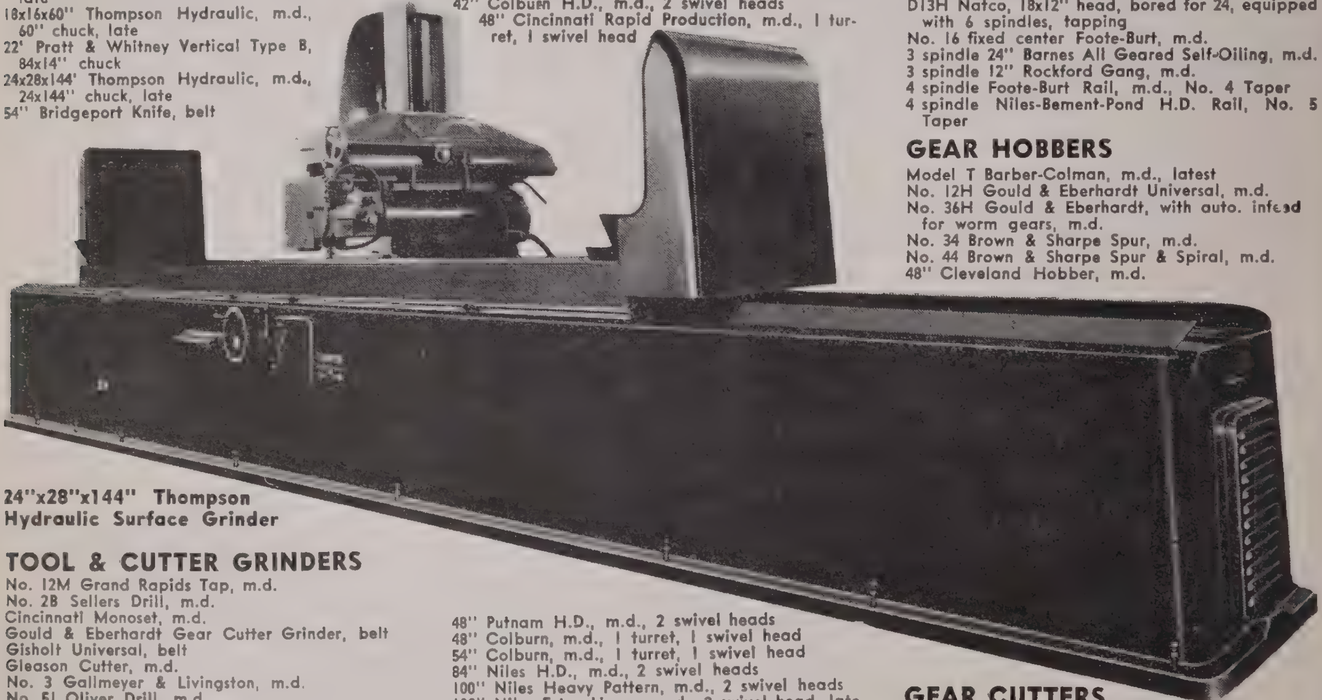
Consulting Engineering Service
Surplus Mfg. Equipment Inventories Purchased

THE SIGN OF QUALITY
THE MARK OF DEPENDABILITY

EASTERN REBUILT MACHINE TOOLS

SURFACE GRINDERS

No. 3 Abrasive, m.d. in base
No. 11 Blanchard, m.d., 16" chuck, late
No. 16-26" Blanchard, m.d.
No. 22-12" Heald Rotary, m.d.
No. 25A-16" Heald Rotary, m.d., late
No. 25A-24" Heald Rotary, m.d., late
No. 33 Abrasive Vertical, m.d., 18x6" chuck
No. 260-16" Heald Rotary, belt
14" Pratt & Whitney Vertical, m.d., 12x36" table
10x12x60" Norton Hydraulic, m.d., 60x10" chuck, late
18x16x60" Thompson Hydraulic, m.d., 60" chuck, late
22' Pratt & Whitney Vertical Type B, 84x14" chuck
24x28x144' Thompson Hydraulic, m.d., 24x144" chuck, late
54" Bridgeport Knife, belt



24"x28"x144" Thompson Hydraulic Surface Grinder

TOOL & CUTTER GRINDERS

No. 12M Grand Rapids Tap, m.d.
No. 2B Sellers Drill, m.d.
Cincinnati Monoset, m.d.
Gould & Eberhardt Gear Cutter Grinder, belt
Gisholt Universal, belt
Gleason Cutter, m.d.
No. 3 Gallmeyer & Livingston, m.d.
No. 51 Oliver Drill, m.d.
No. 4T Sellers Tool, m.d.
Sterling Tool, 3 motor drive
Gleason Cutter, belt

THREAD GRINDERS

No. 33 Excello Precision, m.d., late
No. 39A Excello Internal, m.d., late

DISC GRINDERS

No. 4 Gardner, m.d., 2-16" discs
No. 20 Gardner Disc Grinder & Roll Sander, m.d.
7½ H.P. Standard Elec. Tool Co. D.C. Disc, 18" discs, new
7½ H.P. United States Disc, 18" discs, new

AUTOMATICS

No. 5D2-12" Potter & Johnston, m.d., latest
No. 5D2-15" Potter & Johnston, m.d., latest
No. 6A, 6C Potter & Johnston, m.d.
14" Fay, Flanders Type, m.d.
4 spindle ⅞" Model R-4 Acme-Gridley, m.d.
4 spindle ⅞" Cleveland Model M, m.d.
4 spindle 1¼" Conomatic, m.d., 1942 machine
8 spindle 1⅝" Conomatic, m.d., 1942 machine
4 spindle 2¼" Cleveland Model K, m.d.
2¼" Gridley Single Spindle, m.d.
2½" Cleveland Model A, m.d.
4¼", 4½", 5½", 6", 7¾" Cleveland Model A, m.d.
20x25" Jones & Lamson, m.d., 1942 machine

HORIZONTAL BORING MILLS

No. 25T Giddings & Lewis, 2½" bar, m.d., 1942 machine
Morris Mor-Speed Drilling & Tapping, m.d.
No. 31 Lucas, m.d., 3" bar
No. 33 Lucas, m.d., 4½" bar
No. 45 Giddings & Lewis, m.d., 5" bar
2½" Cleveland, m.d.
No. 0 Giddings & Lewis, m.d., 3⅛" bar
4" Detrick & Harvey Floor Type, m.d.
4" bar Landis Floor Type, m.d.
5½" bar Niles-Bement-Pond, m.d.
10" bar Sellers Floor Type, m.d.
No. 43 Lucas, m.d., 4½" bar

VERTICAL BORING MILLS

24", 36", 42" Bullard New Era, m.d., with side head
36" Bullard Spiral Drive, m.d., side head, taper, thread chasing attachment, 1940 machine
36," 42" Bullard Spiral Drive, m.d., with side head
42" Colburn H.D., m.d., 2 swivel heads
48" Cincinnati Rapid Production, m.d., 1 turret, 1 swivel head
48" Putnam H.D., m.d., 2 swivel heads
48" Colburn, m.d., 1 turret, 1 swivel head
54" Colburn, m.d., 1 turret, 1 swivel head
84" Niles H.D., m.d., 2 swivel heads
100" Niles Heavy Pattern, m.d., 2 swivel heads
100" Niles Extra Heavy, m.d., 2 swivel head, late type
120" Niles Heavy Pattern, m.d., 2 swivel heads

BROACHING MACHINES

No. 4 Oil Gear Type XA, 64" stroke, m.d.
No. 75 H.P. LaPointe Hydraulic, m.d., 150" stroke, 37½ tons cap.
No. 4 LaPointe of Hudson, m.d.
Cincinnati Mill Broach, m.d., 10" spindle, new

BALL BEARING DRILLS

No. ½, 1, 2 Avey, m.d.
No. 1B Edlund, m.d., new
No. 5M-16" Fosdick, m.d.
2 spindle No. 3 Avey, m.d., p.f.
2 spindle 21" Canedy-Otto, m.d., No. 4 Taper
3 Spindle No. ½ Avey Heavy, m.d., latest
4 spindle No. 2 Avey, m.d.
6 spindle No. 2B Edlund, m.d.
6 spindle Henry & Wright Class B, m.d.
6 spindle Leland & Gifford, direct m.d., on each spindle

HORIZONTAL DRILLS

No. ½Bx50" Pratt & Whitney 2 spindle Gun Barrel Rifling Machine, latest
No. ½Bx30" Pratt & Whitney 2 spindle Deep Hole Reaming Machine, m.d., latest
No. ½Bx50" Pratt & Whitney 2 spindle Deep Hole Drill, m.d.. latest
No. 1Bx50" Pratt & Whitney as above
No. 1½x105" Pratt & Whitney as above
No. 1 Pratt & Whitney, older type
No. 1½ Pratt & Whitney, older type
No. 1½Bx105" Pratt & Whitney 2 spindle Hydraulic Gun Barrel Rifling Machine, 105" capacity, latest type
Pratt & Whitney Rifling Machine, belt, older type
5 spindle Detroit Semi-Automatic Hor. Drill, belt
No. 6 Barnes Twin Spindle Hydraulic Honing Machine, m.d., 1943 machine
2 spindle No. 410 W. F. & John Barnes Deep Hole Drill, m.d., latest

MULTIPLE SPINDLE DRILLS

No. 3 Baush, m.d., 16x30" head, equipped with 15 spindles No. 2
No. 3 Baush, m.d., drilled for 34 spindles, equipped with 12, No. 2
P7 Baush Hydraulic, 20x30" head, bored for 22 spindles, equipped with 12
D13H Natco, 18x12" head, bored for 24, equipped with 6 spindles, tapping
No. 16 fixed center Foote-Burt, m.d.
3 spindle 24" Barnes All Geared Self-Oiling, m.d.
3 spindle 12" Rockford Gang, m.d.
4 spindle Foote-Burt Rail, m.d., No. 4 Taper
4 spindle Niles-Bement-Pond H.D. Rail, No. 5 Taper

GEAR HOBBERS

Model T Barber-Colman, m.d., latest
No. 12H Gould & Eberhardt Universal, m.d.
No. 36H Gould & Eberhardt, with auto. infeed for worm gears, m.d.
No. 34 Brown & Sharpe Spur, m.d.
No. 44 Brown & Sharpe Spur & Spiral, m.d.
48" Cleveland Hobber, m.d.

GEAR CUTTERS

No. 3-26" Brown & Sharpe, m.d.
No. 4-48" Brown & Sharpe, m.d.
3" Gleason Straight Bevel, m.d.
Gleason Spiral Bevel Gear Rougher, s.p.d.
8" Gleason Mfg. Type Straight Bevel, m.d.
11" Gleason Straight Bevel, m.d.
12" Gleason Straight Bevel, m.d.
Cincinnati Gear Burnisher, m.d.
No. 1 Brown & Sharpe Spur Gear Tester
National Broach & Machine Red Ring Gear Speeder, m.d., 10" size
Cross Gear Tooth Rounder, m.d., 9" cap.
Gleason Gear Tester, m.d.

CENTERLESS GRINDERS

No. 2 Cincinnati, m.d., Filmatic Spindle, 1942 to 1945 machines (3)
No. 2 Cincinnati, m.d., older type spindle (12)
Cincinnati Valve Seat Grinder, cap. ⅜" valve stems, m.d.

CYLINDER GRINDERS

No. 50 Heald Hydraulic, m.d., 18" spindle
No. 55 Heald, m.d., 24" spindle
No. 73 Heald Airplane Cylinder, m.d., brand new

UNIVERSAL CYLINDRICAL GRINDERS

12x24" Cincinnati Self-Contained, m.d., Filmatic Spindle
No. 2-12x30" Brown & Sharpe, belt
12x30" Landis Hydraulic, m.d., latest
12x36" Cincinnati Self-Contained, m.d.
12x36" Cincinnati, belt
12x48" Cincinnati Hydraulic, model ER, m.d., latest
12x48" Norton, m.d., 1942 machine
16x48" Cincinnati, belt
18x48" Cincinnati Hydraulic, m.d., latest

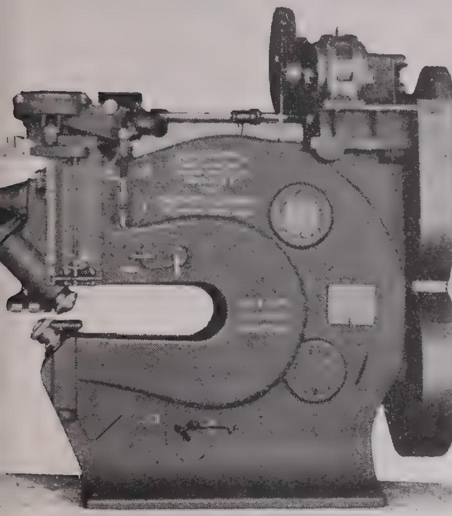
We carry an average stock of 2,000 machines in our 11 acre plant at Cincinnati

Let us quote on your requirements.

THE EASTERN MACHINERY COMPANY

1002 Tennessee Avenue, Cincinnati 29, Ohio • MElrose 1241 • Cable Address EMCO

LATEST TYPE NEARLY NEW MACHINES



QUICKWORK No. 6 Rotary Shear; capacity 1" depth; throat 48"; motor drive.

AUTOMATIC SCREW MACHINES

BROWN & SHARPE #2G High Speed, latest type
BROWN & SHARPE #4, 2" cap., high speed, latest
CONOMATIC 2⅝" 6-spindle, Latest Type
GOSS & DeLEEUW 8" Auto. Chucker, 5 spindle, latest

BORING MILLS—Horizontal

CINCINNATI-GILBERT 3½" Bar Floor Type, Latest
DETRICK & HARVEY 4" bar, Floor Type, M.D.
GIDDINGS & LEWIS #25, 2½" bar, M.D.
LANDIS #35, 3½" bar, Floor Type
LUCAS #41 3" Bar, Table Type, Latest type
NILES BEMENT POND 5", 6" bar, floor type
UNIVERSAL 3" Bar, High Speed, Latest
UNIVERSAL 3A, 3" Bar, Table Type, Motor Drive

BORING MILLS—Vertical

BETTS 120", 2 swivel heads, AC, M.D.
BULLARD 16" 6-spindle Type D Mult-Au-Matics
BULLARD 16" 8-spindle Type D Mult-Au-Matic
BULLARD 36" Vert. Turret, Side head, M.D.
BULLARD 61" "Maxi-Mill", two heads, Motor Drive
BULLARD 36" vertical turret, Spiral Drive, Latest
COLBURN 72", 2 swivel heads, PRT, M.D.
KING 62", 2 swivel heads, PRT, motor drive
NILES 38-44" Vert. Turret, Side Head, M.D.
NILES 100" heavy duty, 10½' height under toolholders, 2 swivel heads, motor drive
NILES 100" Heavy Duty, 2 swivel heads, PRT, M.D.

BROACHES

CINCINNATI 1-30 Duplex, Vertical, Surface, Double Ram, Model ER, Hyd., Latest
CINCINNATI 3-30 Duplex, Vertical, Surface, Double Ram, Model ER, Hyd., Latest

DEEP HOLE DRILLS

LeBLOND #2 Single Spindle, Hydraulic, Latest Type
PRATT & WHITNEY ½B x 30", 2 spdle., latest

DRILLS—Radial

AMERICAN 4'11" Hole Wizard, latest type
AMERICAN 4'12" triple purpose, motor drive
AMERICAN 5'13" triple geared, motor drive

GEAR CUTTING EQUIPMENT

BARBER COLMAN Type S, #12 Hobber, motor drive
BROWN & SHARPE No. 3H gear cutter, M.D.
FELLOWS Model Z Gear Shaper, High Speed, Latest
FELLOWS #61, #7A, #72, #75, #725, #61A, #77 High Speed Gear Shapers, Latest
FELLOWS #12M Involute Measuring Instrs., Latest
FELLOWS #6Z2 Gear Shaper, high speed, latest type
FELLOWS #13LS Lapper, latest type
FELLOWS 8M Red Liner, latest type
GLEASON 3" & 12" Straight Bevel Generator, latest
GLEASON #20 Spur Gear Tester latest type
GLEASON #4, #6, #18 Bevel and Hypoid Tester
GOULD & EBERHARDT 12H, 12HS Hobber, latest
GOULD & EBERHARDT 36H Hobber with Diff., M.D.
PRATT & WHITNEY 10" Grinder, hyd., latest

GRINDERS—Cyl.—Plain & Univ.

BROWN & SHARPE #1, 2, Universal, Latest
BROWN & SHARPE #5 Plain, 3x12, Latest Type
BROWN & SHARPE #20, 10x18 plain, latest type
CINCINNATI 6"x18" Plain, Model EA, Hyd., latest
CINCINNATI 16"x36" Plain "Filmatic", latest
LANDIS 4x12, 4x18, Type H, Plain, Hyd., latest
LANDIS 6x18 Plain Type C, Hyd., latest
NORTON 6x18 Type C Plain Hydraulic, Latest
NORTON 10"x72" Type C Mech., Latest
NORTON 14"x36" Type C Plain, Hydraulic, Latest

GRINDERS—Miscellaneous

BRYANT #5, #16-16, #16-CP-16, #24, Internal Hydraulic, latest type
CINCINNATI Centerless Lapper—Model E.D.--Latest
CINCINNATI #2 Centerless "FILMATIC"—Latest
CINCINNATI #3 Centerless, Motor Drive
CINCINNATI "Monoset" Tool & Cutter, Latest
CINCINNATI #2 Plain Cutter & Tool, latest type
COVELL #22 Universal Tool & Cutter, latest
FITCHBURG 14"x25" Spline, hydraulic, latest
HEALD 72A3, 72A5 "Gagematic," Internal, Latest
HEALD 75A, 72A3, 72A5, 74, Internal, latest type
JONES & LAMSON 6x15, 8x48 Thread Grinder, latest
PRATT & WHITNEY Contour Cutter, Latest
THOMPSON 6"x48" Auto., round broach, M.D.

GRINDERS—Surface

ARTER 8" Auto. Piston Ring, M.D.
BLANCHARD #16, 24" chuck, M.D.
BLANCHARD #11 Vert., 16" Mag. Chuck, Latest
DO-ALL Model G-7 9"x20", Latest Type
GALLMEYER & LIVINGSTON #35, 8x24, Latest
HEALD #22 Rotary, 12" chuck, latest type
HEALD 25A Hydraulic, Rotary 16" or 30" Magnetic Chuck, Latest Type
NORTON 6x18 Hydraulic, latest type
THOMPSON 12x12x24 Type B Hyd., Latest Type
THOMPSON 12x12x40 Type B Hyd., Latest Type

JIG BORERS

PRATT & WHITNEY #1A, Motor Drive
VERNON Precision, M.D., Latest

LATHES—Engine and Mfg.

AMERICAN 36x360 centers, 2 Car., Geared, M.D.
BRIDGEFORD 36"x32' bed—2 carriages, M.D.
JONES & LAMSON "Fay" 20x25 "automatic, latest
LEHMANN 16x30" centers, TIMKEN, latest type
LODGE & SHIPLEY 18x72 centers, M.D.
LoSWING 4x60, 4x84, 8x60, 8x108, 5x34, Latest
MONARCH 12x30" centers, TIMKEN, latest type
MONARCH 12"x54" centers, Model C, Timken, Latest
MONARCH 16x28" geared head, M.D.
MONARCH 10" 20" centers, Model EE, Timken, latest
MONARCH 22"x456" Centers, 3 carriages, Taper att., Timken, Latest
MONARCH 24"x54" Centers, Geared, Motor Drive
MOREY Model A 8"x120" shaft turner, Latest Type
NILES 42"x60" double head, motor drive
NILES 72"x62' centers, comb, Boring Turning
NILES 30x50' Boring, Timken, Latest Type
NILES 48x87' centers, comb, boring and turning, M.D.
NILES 90"x110" Centers Car Wheel, M.D.
PRATT & WHITNEY 10"x20" centers Bench, latest
PRATT & WHITNEY 16"x60" centers, Geared, M.D.
REED PRENTICE 16x24" centers, geared head, M.D.
REED PRENTICE 16x48" centers, geared head, M.D.
SPRINGFIELD 14"x6' bed, geared head, M.D.
SPRINGFIELD 16"x6' bed, geared head, M.D.
SPRINGFIELD 16"x30" centers, Timken, latest type
WARD, HAGGAS & SMITH—18/30x66" centers gap, motor drive, Latest Type

LATHES—Turret

BARDONS & OLIVER #5, #7, TIMKEN, Latest Type
CINCINNATI ACME No. 1, Timken, Latest
FOSTER #4FU "Fastermatic," Timken, latest
GISHOLT #1L, #2L Universal, Timken, Latest
GISHOLT #3, #4 Univ. Bar, Latest Type
JONES & LAMSON #3 Univ. Bar and Chuck, Latest
JONES & LAMSON #5 Univ. Bar and Chuck, Latest
LIBBEY 1H5 Timken, Latest Type
MOREY No. 2G, No. 3, No. 4, Timken Bearing, latest
POTTER & JOHNSTON 5D2E Auto., Timken, latest
POTTER & JOHNSTON #5D Auto., Timken, latest
WARNER & SWASEY 5, Universal, Timken Bearing
WARNER & SWASEY 1A Univ. Chucking, Latest
WARNER & SWASEY #2A Univ. Bar & Chucker, with or without preselector head, latest
WARNER & SWASEY #1A, #3A Univ., M.D.

MILLING MACHINES—Mfg.

CINCINNATI 24" duplex, TIMKEN, M.D.
HALL Style D Planetary, latest type
INGERSOLL 42"x38"x12' adj. rail, 4 heads, A.C., M.D.
INGERSOLL 32x24x16' Planer Type 2 heads, AC, M.D.
INGERSOLL 32x30x12' adj. rail slab, M.D.
SUNDSTRAND #3A Duplex, 42" feed, Latest
TAYLOR & FENN M80 Duplex Spline, latest

MILLING MACHINES—Plain

BRIGGS Type A, 12" & 18" Feed, Latest Type
BROWN & SHARPE #2 Light Type, Timken, Latest
BROWN & SHARPE #3B, Timken, Latest
BROWN & SHARPE #12, 24" Feed, Latest Type
CINCINNATI 0-8 Automatic rise and fall, latest
CINCINNATI 1-12, 2-18, Auto., Timken, Latest Type
CINCINNATI 4-48 Hydromatic, 4 spindle with following attachment, Latest Type
CINCINNATI #3, 4, 5, Motor Drive
CINCINNATI 4-36 Hydromatic, Latest Type
KEARNEY & TRECKER 1218, TIMKEN, latest
KEARNEY & TRECKER #3, 4, Heavy, Timken, M.D.
KEMPSMITH #4 Maximiller, Timken, latest type

MILLING MACHINES—Thread

HANSON & WHITNEY 4"x9", Latest Type
LEES BRADNER 12x24 Model HT, latest type
MOREY 12x30, 60, 120, 190, Latest Type
PRATT & WHITNEY 6x60 Model C, Latest Type

MILLING MACHINES—Vertical

CINCINNATI #2, #3, #4 Dial Type, Timken, latest
CINCINNATI #08, TIMKEN, Latest Type
CINCINNATI #3, #4 High-Powered, M.D.
GORTON 9J Hand Feed, Latest Type
KEARNEY & TRECKER 3H Timken, Latest
MOREY 12M 2-spindle Profiler, Latest
REED PRENTICE 3VG, with or without Hyd. Duplicator, Timken Bearing, Latest Type
SUNDSTRAND #3A, rotary, Latest Type
SUNDSTRAND #3 Profiler and Channel, Latest

PLANERS

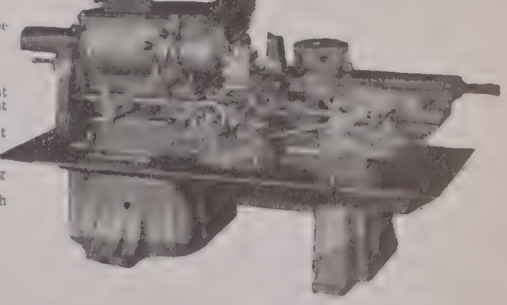
CHANDLER 36x36x20', 4 heads, AC, M.D.
DETRICK & HARVEY 48x48x16', 4 heads, Hyd.
GRAY 36"x36"x8'—2 heads, Max. service, D.C. variable speed, Motor Drive
LIBERTY 24x24x8' Vari-Voltage, Latest Type
NILES 54"x54"x18' 4 heads, Box Table, M.D.
NILES BEMENT POND 48x48x18', 2 heads, AC, M.D.

PRESSES

BIRDSBORO 325 ton, vert. hyd., Latest Type
CHAMBERSBURG 50 ton, vert., hydro-pneumatic
CLEARING Type DS-1125-32 dbl. action 125 ton, Latest Type
FERRACUTE #DG-55 75 ton drawing, Latest Type
HPM 37 Ton Vertical Hydraulic, Latest Type
LAKE ERIE 500 Ton Vertical Hydraulic, Latest Type
WATSON & STILLMAN 20 ton hyd., sgt., latest

MISCELLANEOUS

AJAX 1½", 3½" Upsetter and Forger, Motor Drive
BARNES #172, 306H, 307 Vertical Hone, Latest
BILLINGS & SPENCER 1500 lb. Broad Drop Hammer
CAMPBELL 401 Abrasive cut-off Saw, Latest
CLEVELAND 12"x16' centers—Cutter Reliever, M.D.
DILL 20"-24" Vertical Slotter, M.D.
GOULD & EBERHARDT 16"x20" "Ind." Shaper, latest
GROB #0S20 Saw and Filer, Latest
MICHIGAN #1708A Cutter, Reliever, Latest
NATCO Model 4BL Multiple Spindle Drill, Latest Type
NATCO Model B225H, Adj. Mult. spindle Drill, Latest
NAZEL #4B Pneumatic Hammer, M.D.
PRATT & WHITNEY ½Bx50" Rifler, Latest
PRATT & WHITNEY (KELLER) Type BL-2416 Copying, latest type, 2 & 3 Dimensional
PRATT & WHITNEY (KELLER) Type G Copying, latest type, 2 Dimensional
QUICKWORK ¾", 1" Cap., Rotary Shear M.D.
SMITH & MILLS 16" High Speed Shaper, Latest



GISHOLT #3 Universal Ram Type Turret Lathe; TIMKEN bearing, bar or chucking; swing over bed 18½"; bar capacity, round 1½"; LATEST

Available for Prompt Shipment

Most Built After 1941

(Partial List) Over 2,000 Machine Tools in Stock. Your Inquiries Are Invited . . . Prompt Service is Assured.

MOREY MACHINERY CO., INC.
BROOME & LAFAYETTE STS., NEW YORK 13, N. Y.
TELEPHONE: CANAL 6-5360
CABLE ADDRESS: WOODWORK, N. Y.

Hard-To-Get Tools

AARON MACHINERY CO., Inc.

BORING MILLS

Universal 3" Horiz., Late
No. 0 Giddings & Lewis, M.D., 3"
2", 4" Binsee, 2½" Cleveland, M.D.
Niles-Bement-Pond 4" duplex
24", 42" Bullard New Era Vertical T.L.
King 42", 2 heads on rail., M.D., Vertical

TURRET LATHES

W. & S. Nos. 3, 4 Preselector, M.D., 2A
Foster Nos. 4, 5, 6, 1B, 3B, M.D., Univ.
J. & L. 2¼" x 24", 3¼" x 36"
Oster 601, Rapiduction, Fully Equipped, Late
Acme, M.D., 6W, 2½" Cap., Late, 3¼"
Gisholt #4, 5, Late, 2L, M.D.
Hardinge 2nd Operation Machines, Late, ESM 59
B. & S. Nos. 1, 2, 2F Hand Screw
Morey No. 3, Bar Feed, Late

GRINDERS

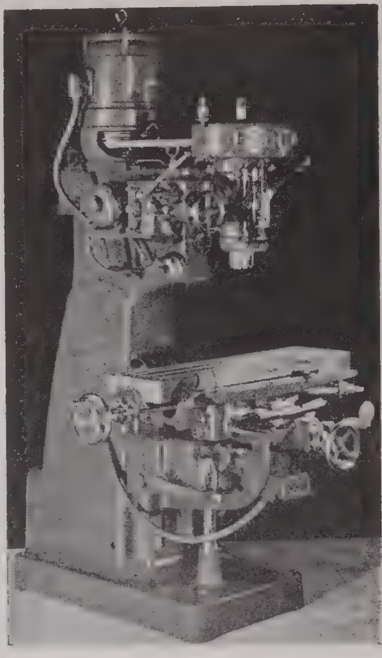
Brown & Sharpe #5 Cyl. 3 x 12 cap., late
Covel No. 91A Tool (1941)
Norton 6 x 18", Hyd. Surface, M.D., Late
Heald No. 25A Rotary Surf., Like New
No. 2 Cincinnati Centerless, M.D., Filmatic 1943
Cin. 12 x 36" Univ. Hyd., Late, Filmatic
Thompson 6 x 18" Hyd. Surface, Type C & F
K.O. Lee A 600 Tool, Gorton Cutter Gr.
P. & W. 14", B.B., Vert., 19 x 49
Blanchard 30", M.D.; Modern 12 x 48", M.D.
Norton Hydraulic, 12" x 18", M.D.
Heald No. 72A3 Gagematic, Internal
Norton 50" x 28' Roll Grinder
Landis 6 x 20", Hydraulic, M.D.
Nos. 55, 60, 65, 70 Heald Int., M.D.
B. & S. Nos. 1, 3, Univ., Bryant No. 12, M.D.
B. & S. Nos. 10, 11 S.P.D., #2, 2B Surface
12" Heald Rotary, M.D., 12" Arter
B. & S. Nos. 2, 2B Surface, M.D., Late
Abrasive #34 Vert. Surf., 3B, 8" x 24", Late
Grenby G-2, Internal, Sanford Surf.
Sellers 4G, Oliver 510, G & L Drill Grinders
Gallmeyer & Livingston Hydr. surf. No. 25, 6" x 18", #35 8" x 24", #18, Hand Feed
Pratt & Whitney 12" x 36" vertical surf.
Black Diamond Drill Grinder
Reid 2A, 2B, 2C Surface Grinders

LATHES

16" x 78" Lodge & Shipley Grd. Hd. T.A., Late
Monarch EE 10 x 20" toolmakers, Late
LeBlond 15" x 30", M.D., late, 19" x 120" Gap
Wade, Hjorth, P. & W., Elgin Precision Bench
P. & W. 1 x 18 Automatic, 9" LeBlond Prod.
Hendey, 12" x 30", Grd. Hd., 14" x 6', 16" x 8'
36" x 30' Putnam, M.D., 42" x 16', G.H.
36" x 20' Putnam, S.C.G., D.C., M.D.
32" x 35' Wickes Grd. Hd.
Boye & Emmes 20 x 30' Grd. Hd., M.D., 26" x 12'
Sebastian 14' x 5' Grd. Head, Sheldon S56
South Bend 10" x 4', 13" x 6', 9" x 3'
Hardinge Precision Cabinet—Late—Rivett, Elgin

MILLING MACHINES

Van Norman No. 12, 20 Duplex, well equipped



High Speed Vertical Mill

NEW IN STOCK

Power Shears—52", 72" & 96" 4, 5, 7, 10, 12, 18, 30 ton O.B.I. Power Presses • 7" Ammco Shapers • 8" Shape-Rite Shapers • #1½ Abrasive Surface Grinder • Halco H.S., Vertical Heads, Drill Presses • Kalamazoo Metal Band Saws • Spot & Arc Welders • 6 x 6" Racine Hacksaws, Hyd. • 20 ton Northern Hyd. Presses • Air Hydraulic Presses • Foot Presses • Foot Shears • Inj. Molders.

Van Norman #26, Univ. Hd. on Ram
Cincinnati No. 3, Rect. Overarm
Cincinnati #4 Vert. Dial Type
Burke Bench Pl., Univ., Late—Nichols
Cincinnati 1-12, 2-18 Production
10" P. & W. Automatic
No. 3S Cincinnati S.P.D., rapid traverse
Nos. 3, 4, 5 B. & S Plain and Univ.
B. & S. No. 12, Elec. Prod., #000 Prod.
Hall Planetary Model D Thread Miller
Becker Nos. 3, AB, 5, 6, Vert.
Nos. 3, 4 Cincinnati Vert., 2
P. & W. No. 12 Profilers
K. & T. B. & S. Nos. 2, 3, B. & S. No. 3 Vert.
Gorton 8D, 9J, Vert., M.D., 9J Duplicator
No. 2, 2A Brown & Sharpe Univ., 2B K. & T. Univ.
No. 1 Cleveland Vert. & Univ.
Van Norman Prod. Mill

Write for free Illustrated Catalog

HYDRAULIC EQUIPMENT

600 Ton Southwark, Platen 76" x 59", 22" Stroke, 36" opening, 40 H.P., 3-60-220 V Motor
1000 Ton French Oil, Platen 53" x 42", 20" stroke, 50" opening
500 ton H.P.M. Double Action, 160 Ton Cushion Platen 36 x 36", Stroke 24", opening 30"
500 Ton Lake Erie, Platen 35" x 36", stroke 36", opening 68", 150 H.P., 3 Phase, 60 Cycle, 440 Volt Motor
350 Ton Verson Press, Platen 40" x 40", stroke 36", opening 72", 100 H.P., 3 Phase, 60 Cycle 440 Volt Motor
Watson-Stillman 500 Ton Shaft Straightening Hyd. Self-contained press. Equal to new. Also 400 Ton Straightener
Brand New 300 Ton Hobbing Press & Motor Driven Pump

ALSO MANY OTHER PRESSES, PUMPS AND ACCUMULATORS

RADIALS

Carlton 8', 19" col., motor on arm
Canedy-Otto 3'9", Late
5', 6' American Triple Purpose Radial
6' Cincinnati-Bickford, 4', 5' Western, S.P.D.

AUTOMATICS

Acme Gridley RB6, 6 Sp., 2⅝", 1944
Cone 8 Spindle, 1⅞", Late, Bar Feed
⅞" Cone 4 Spindle Gridley
B. & S. #4 & 6 Auto. Tooling
B. & S. 00G, Late, 3 in Stock

MISCELLANEOUS

Reed Prentice 6 oz. Inj. Moulder, Late
Toledo 400 ton Knuckle joint Press
Kling 10' x ½" Cap. Bending Rolls, Late
Bliss #18, 19, 20, 21 OBI Presses
Niles-Bement-Pond 2500 lb. steam hammer
Clearing 90-10 12' Press Brake, M.D., 1942
Ferracute DDG-56 105 ton double acting Cam Press
No. 0 Buffalo Angle Roll, M.D., Excel. #14
Deckel G1, G1F, G2 engraving mach.
Gorton Engraving Machine 3Z, 1A, 1D, 3U, 3L
Hanson-Whitney Thread Miller
High Speed Hammers All Sizes
P.&W. 6" Vert. Shaper, N.B.P. 15" Slotter, M.D.
Marshalltown Throatless Shear
Federal #5 OBI Press, Late, Diamond #31
Landis #6 Thread Grinder, Late
Ohl 12' 10 Ga. Brake, Buf. 25 UD Iron Worker
Bliss #4 5½ Backwheel Press, 47, 3A Horning
Bliss No. 58, 62, 62A, 162 O.B. Gap Presses
Marvel 6A Auto. Hacksaw, M.D., #8 Bandsaw
McKenzie Ship Separator, Barrett Extractor, DeLaval
Excelsior, Delta, Walker Turner Drills
V & O #2½ O.B.I., 102 Red. Press.
Waterbury-Farrell #30 Thread Roller W. Dies, '43
Onsrud Router W 240, Late
Z & H 35 Ton, Niagara 44A Backwheel
Brown & Sharpe #13 Gear Cutter 3-26
Red Ring, Gleason, Michigan Gear Checkers
Gleason Surface Hardening Machine
Davis #4 Keyseater, Porter Cable G8 Wet Sander, 8"
Delta Table Saws; Oliver, Pryibil Planers
Consolidated 103 OBI, Bed 12 x 40"
Micromatic Hydrohoner, H1; Speed Lathes
Bakewell No. 1, Ultromat Tappers
Tannewitz #36M Band Saw, 36"
Thompson, Sciaky Spot & Seam Welders
Dreis & Krump 334 Press Brakes, Wales Dies
Baker #2 Keyseater, Clark Hardness Testers
Chicago, Pexto, Ohl Shears, Brakes to 8'
Leland Gifford MS Drills, Excelsior 21"
Bliss 30" Gang Slitter, Wilder Optical Comparator
Gen. Flexible Elec. Screw Press
Sheldon 12" B.G. Shaper—Brand New
6 spindle Avey Drill, 15" overhang

AARON MACHINERY CO., Inc., 45 Crosby Street, New York 12, N. Y.
"CABLE—AARMACH N. Y."
Telephone WOrth 4-8233

LATHES FOR SALE

BRIDGEFORD 36x24' centers Motor Drive
JONES & LAMSON "Fay" 20x25" Auto. Latest Type
LODGE & SHIPLEY #5 Duomatic Latest Type
LODGE & SHIPLEY 18x72" centers Motor Drive
LOSWING 8x60" centers Latest Type
NILES 26x48" and 72" centers Motor Drive
NILES 30x50' boring "Time Saver" Latest Type
NILES 30x100" centers Motor Drive
NILES 42x39' centers Motor Drive
NILES 48x87' centers boring and turning MD
NILES 72x59' centers boring and turning MD
PUTNAM 42x25' centers geared Motor Drive
SCHUMACHER & BOYE 24x158" centers geared MD

HARRISON MACHINERY EXCHANGE, INC.
South 4th St. Harrison, N. J.
Tel.: HUMBOLDT 2-5750, 2-5775

MACHINE TOOLS

Bliss Presses, #88 (255-ton, 24" stroke) 306½ (161-ton, 8" stroke)
Chip Crusher, American Pulverizer Type ST T
Norton Hyprolap, 26 KF—1943
Vertical Hyd. Grinder, Hanchett Model 300, used 6 mos.
Grinder, Norton Horizontal External, Cylindrical, Type C, 16x36, head travel 8", 1942
24" Cincinnati Universal Shaper, Heavy Duty
1½" Shackles, screw pin type, galv. new—10 or more $1.00 ea.

THE ELYRIA BELTING & MACHINERY CO.
Box 5 Elyria, Ohio

GUARANTEED TOOLS

BG1 Type 482 KELLER Automatic Duplicating Machine, three dimension, 24" x 48"
20/24" GOULD & EBERHARDT Industrial Universal Shaper, 1944
28" OHIO Shaper, power downfeed, 1941
32" OHIO Shaper, power downfeed, 1942
36" OHIO Extra Heavy Shaper, 1943
48" x 28' NEW HAVEN Geared Head Lathe
6' CINCINNATI BICKFORD Radial Drill, 15" column, motor on arm
42" x 42" x 12' INGERSOLL Planer Type Mill, adj. rail, 4 heads

O'CONNELL MACHINERY COMPANY
1821 Niagara Street Buffalo 7, New York

FRICTION SAW

Slightly used 48" Kling down stroke Friction Saw with 75 HP. Motor 3/60/220 V. with hydraulic pump. New 1942. Excellent.

GALBREATH MACHINERY CO.
306 Empire Bldg. Pittsburgh 22, Pa.

ROLL GRINDER, LATE TYPE, 10" x 48"
BAIRD 6 Sp. Automatic Chucker
MOLINE 3 Sp. Model 7-D Cylinder Borer

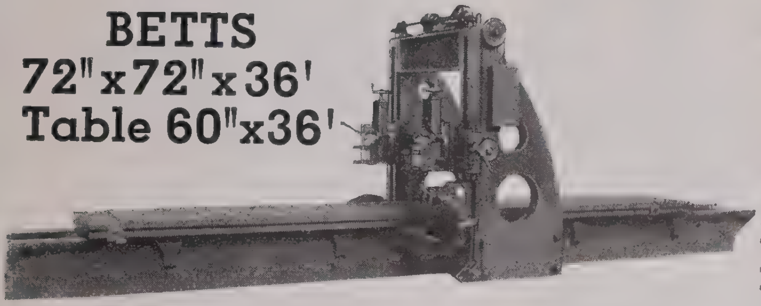
Continental Salvage & Machinery Corp.
1836 Euclid Ave. Cleveland 15, Ohio

Torrington 48" Slitter, M. D.
No. 2A W & S Turret Lathe, chucking.
LaPointe 60" Univ. Broach Sharpener.
United Engineering 20" x 20" Recoiler.

D. E. DONY MACHINERY CO.
47 LAURELTON ROAD, ROCHESTER 9, N. Y.

EMERMAN OFFERS FROM **STOCK**

Outstanding 36 foot Planer



BETTS
72"x72"x36'
Table 60"x36'

2 Heads on Cross Rail
2 Side Heads
Direct Connected D.C.
Reversing Motor Drive
Individual Motor for
Power Raise and
Lower of Rail

36" OHIO UNI.
Heavy Duty Shaper

FOR IMMEDIATE DELIVERY

- *96" x 72" x 25' NBP Double Housing Planer*
- *72" x 64" x 14' Ingersoll Planer Type Mill (3 Heads)*
- *54" x 18' Houston-Stanwood & Gamble Heavy Duty Engine Lathe*
- *2000 Ton HPM. Fastraverse Hobbing Press*
- *16'–24' NBP Extension Type Boring Mill*
- *7" Detrick & Harvey Horiz. Planer Type Boring Mill*
- *No. 1 Hilles & Jones Plate Straightening Rolls*
- *27" x 38' Lehmann Hydratrol Hollow Spindle Lathe*

Find the Answer to Your Problems in Our Ever Increasing Stock

EMERMAN MACHINERY CORP.
875 W. 120th STREET
PUlman 5-7626
CHICAGO 43, ILL.

MILLERS FOR SALE
BRIGGS Type 2A 18" feed Hyd. Latest Type
BROWN & SHARPE #13 Plain Auto. Motor Drive
BROWN & SHARPE #21 Plain Auto. Motor Drive
CINCINNATI 24" Duplex Timken Motor Drive
CINCINNATI #3, #4 Plain rect overarm Motor Drive
CINCINNATI #3, #4 Vertical Motor Drive
HALL Style D Planetary Latest Type
INGERSOLL 30x24x12' Planer Type Motor Drive
KEARNEY & TRECKER #4 Heavy Timken Motor Drive
LEBLOND #4 Plain Belted Motor Drive
SUNDSTRAND Model 3A Duplex Timken Latest Type
SUNDSTRAND Model 3A Vertical Rotary Latest Type
SUNDSTRAND #3 Profile & Channel Latest Type
VAN NORMAN #3 Duplex Universal Motor Drive

HARRISON MACHINERY EXCHANGE, INC.
South 4th St. Harrison, N. J.
Tel.: HUMBOLDT 2-5750, 2-5775

COMPLETE PLANT LIQUIDATION

Machine Tools, Including 32" Cincinnati Shaper, Grinder, Lathe, Milling Machine, Etc.

Forge Shop Equipment, Miscellaneous Items.

Inspection 9-5:00 any day except Sunday

General List Mailed on Request

Address—R. L. GOODRICH, *Agent*
Quality Forgings, Inc.
Bowling Green, Kentucky

McKAY ROLLER LEVELERS
54" and 48"

Each machine has 17 rolls, 2⅞" dia.; 15 HP AC motor; parallel adjustment of rolls; approximate age 15 years. Very Good Condition. May be inspected under power.

MACHINERY LIQUIDATING CO.
2308 W. Warren Ave. Detroit 8, Michigan

PRICES SACRIFICED

to

Sell IMMEDIATELY Before Moving

World's Largest Aeroplane Engine Plant.
Location: Cincinnati, Ohio

Every item New 1941 to '43—not used since '45 and complete as installed

BRIEF and PARTIAL LISTING

ELECTRIC TRAVELING CRANES

1—5 Ton Shaw-Box—Double box girder, 3 motor, a.c. 3 ph. 60 cy. 440 volts, pendant push button floor control, SPAN 60 ft.
1—5 Ton HARNISCHFEGER—Double girder, 3 motor, a.c. 3 ph. 60 cy. 440 volt, pendant push button floor control, SPAN 60 feet.
1—5 Ton HARNISCHFEGER—Double girder, 3 motor, a.c. 3 ph. 60 cy. 440 volt, pendant push button floor control, SPAN 38 feet.
1—2 Ton HARNISCHFEGER—3 motor—a.c. 3 ph. 60 cy. 440 volt, pendant push button floor control, has underslung trucks—SPAN 28 feet.

HEAT TREATING EQUIPMENT

31—50 & 100 KW Westinghouse, Bell Type Elec. Nitriding Furnaces
11—85 KW Leeds & Northrup Homo-Carb Elec. Fur.
2—65 KW Ajax Electric Salt Bath Furnaces
1—E. F. Gas Conveyor type Annealing Fur. with return Convey.—36"W x 70'L
1—E. F. 127 KW Elec. Conveyor type Annealing—1350°
3—E. F. Gas Conveyor type Annealing Fur. 1700° F 38"W x 60'L
4—Billet Furnaces—4' x 8'—Gas—1800° F
1—40 KW Mahr Elec. Conveyor Fur. 10'L x 3'W
1—30 KW Mahr Elec. Conveyor Fur. 10'L x 5'W
5—Gas Generators
1—Hannifin Quench Press
Bonderizing Machines
Degreasers—Washers—Dryers—Roller Conveyor—Floor Grill—etc.
All equipment complete with all Control Equipment—Over 400 L & N Electric Control Instruments.

WHEELABRATORS

4—#2 (8' table) Wheelabrator Tablast. PRICE EACH	$2,500.00
1—20" x 27" Wheelabrator Tumblast, Rubber Lined. PRICE	$1,500.00

2—American Foundry sandblast cabinets
2—A.C. Model C heavy duty spark plug cleaners

DUST COLLECTORS

American Dustube collectors
1—New Pangborn CH2-4564
15 Type W Rotor Clones, all sizes

PLATING EQUIPMENT

2—KW Chandeysson, synchronous, 1000 Ampere, 6 volts
5—20 KW Chandeysson, synchronous, 500 Ampere, 40 volts
5—40 KW Chandeysson, synchronous, 1000 Ampere, 40 volts
Electric Ovens, Gas Ovens, Spray Booths, Degreasers, Gas Dryers, Automatic Washing Machines. Anodes, Etc.

Limited Time Necessitates Immediate Inspection!

ACT TODAY! **Wire us and we will phone you and arrange for your inspection at Cincinnati, O.**

L. J. LAND, Inc.

146 GRAND STREET, NEW YORK 13, N. Y.
Phone CAnal 6-6976

ReMANUFACTURED -(ORIGINATED BY US)- MACHINE TOOLS

Reg. U. S. Patent Office

AUTOMATICS
- No. 6 Brown & Sharpe
- No. 2 Brown & Sharpe
- 1⅝" Greenlee, 6 spdls.
- No. 61 New Britain, 6 Spdl.-2¼"

BORING MILLS
- 36" Rogers
- 72" Cincinnati
- 84" Betts

DRILLS
- No. 150 Baker
- No. D-8 Colburn, No. 6 M.T.
- No. 2 LMS—26"—2 Spdl. L-G (1945)
- No. 2MA-6—15"—4 Spdl. Avey
- No. 2 LMS—26"—4 Spdl. L-G
- No. 4 BL Natco—36 spdls.
- 7'-15" Col. American Univ. Radial

GEAR MACHINERY
- No. 712 Fellows Auto. Indexing (1942)
- No. 18-H Gould & Eberhardt
- No. 13 Gleason Tester
- 11" Gleason Bevel Generator
- 72" Cincinnati Gear Cutter

GRINDERS
- 4"x12" Landis, Model H (1942)
- 4"x18" Landis, Model H (1942)
- 6"x18" Norton Type C Plain (1943)
- 6"x30" Norton Type C Plain (1943)
- 10"x18" Norton Type C Plain (1943)
- Norton Motor Driven Plain Grinders 6"x18" ——— to ——— 240"
- 12"x36" Landis Univ. Type LCH (1945)
- No. 5 Covel Hydraulic Surf. (1941)
- 24"x24"x84" Mattison Hydr. Surf.
- No. 34 Abrasive Surf. (1943)
- No. 22—12" Heald Rotary Surface
- No. 25A—24" Heald Rotary Surf. (1943)
- 72A-3 Heald Internal Gdr. (1943)
- 72A-5 Heald Internal Grinder (1942)
- No. 5 Bryant Internal Grinder
- No. 24—26" Bryant Internal (1942)
- 10"x72" Colonial Breach GDR.

HORIZONTAL BORERS
- No. 31 Lucas 3" Bar
- No. 3A Universal 3" Bar
- No. 26—4½" Bar Defiance (1943)
- No. 46B Heald

LATHES
- 14"x6' Hendey
- 15"x5' Sebastian
- 16"x54" Centers LeBlond
- 36"x30' Lodge & Shipley
- 36"-48"x16' Lehman Hyrdrotrol (1945)
- 48"x20" Simmons (1942)
- 50"x17' Centers LeBlond (1942)
- 8"x15" Sundstrand (1942)
- 10"x22" Sundstrand, Model AA (1943)
- 12"x18" Lipe-Carbo
- 16"x33" Fay Automatics (1942)
- 20"x25" Fay Automatics (1942)

MILLING MACHINES
- No. 4 Cincinnati Plain (1943)
- No. 2H Milwaukee Vert. (1942)
- No. 2 Cincinnati Vert. (1942)
- No. 2M Cincinnati Vert. (1941)
- No. 3 Cincinnati High Power Vert.
- No. M-18 Milwaukee Simplex (1942)
- No. M-24 Milwaukee Simplex (1942)
- No. 1-18 Cinn. Mfg. (1940)
- No. 2-8 Sundstrand Electromill (1942)
- No. 4-48 Cinn. Plain Hydromatic (1942)
- No. 45-48 Cinn. Plain Hyd. Tracer (1942)
- No. 56-90 Cinn. Plain Hydromatic (1943)
- 4"x9" Hanson-Whitney Thread Miller
- 4½"x12" Pratt & Whitney, Model C
- 6"x20" Pratt & Whitney, Model C
- 6"x36" Lees-Bradner Thrd. Miller (1942)
- 6"x132" Pratt & Whitney Thrd. Miller
- 38"x40"x10' Fitchburg Duplex (1943)
- 24"x24"x12' Ingersoll Adj Rail
- 36"x36"x16' Ingersoll adj. rail, 4 hds.
- 72"x6' Ingersoll Face Miller

PLANERS
- 36"x36"x12' Cincinnati
- 36"x36"x18' Gray
- 48"x36"x14' Gray
- 48"x48"x12' Cincinnati

TURRET LATHES
- No. 2 B. & S. Screw Machine, Wire Feed
- No. 5 Warner & Swasey (1942)
- No. 5 Bardons & Oliver (1942)
- No. 5 Foster, Bar Feed (1942)
- No. 2A Warner & Swasey
- 1-H Libby, Extra Long Bed
- No. 1-H Libby, 6¼ Spdl. Hole
- No. 4A Warner & Swasey, 7½" Spdl. Hole

MISCELLANEOUS
- 18" Dill Slotter
- No. 22-C Racine Shear Cut Saw
- No. 0 Bakewell Tapper
- No. 20 Bliss O.B.I.
- Model H-7 Micromatic Hone
- Model H-705 Micromatic Hone
- Model 200 Micromatic Hone

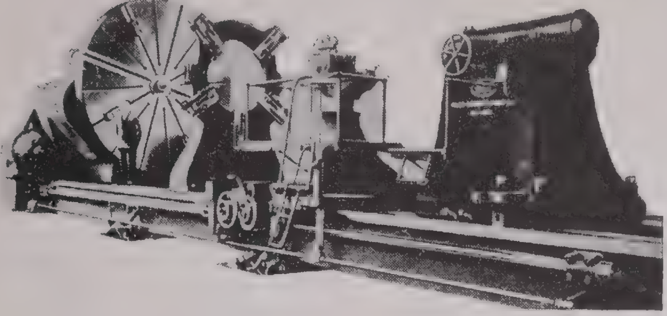
HILL-CLARKE
MACHINERY CO
647 Washington Blvd. - Chicago

ENGINEERED REBUILT MACHINE TOOLS

ENGINEERED REBUILT

BUILT MACHINE TOOLS

14' x 50' (34' centers) NILES LATHE



14' x 50' (34' centers) NILES SCREW CUTTING ENGINE LATHE, Power rapid traverse to carriage, compound rest. Arranged for motor drive.

SPECIFICATIONS:

Max. swing over ways	174"
Swing over carriage, gap piece out	153"
Swing over carriage, gap piece in	138"
Takes between centers, max.	408"
Steel spindle bearings, front	22"
Steel spindle bearings, rear	14"
Diameter of face plate	144"
Face of steel internal driven gear	8"
Carriage bearing on ways	88"
Feeds 27; range per RPM	.010 to .400
Threading range	.100 to 4"
Steady rest range, dia.	28" to 50"
Tailstock bearing on bed	87" x 72"
Tailstock spindle—12"; adjustment	24"
Speed range, RPM	.233 to 23
Lead screw diameter	3⅞"

EQUIPMENT:

Main drive motor, power rapid traverse motor and motor for moving tailstock. Compound rest, four face plate chuck jaws, steady rest.

Net weight, appx. (lbs.) 190,000

Boxed wgt. appx. (lbs.) 210,000

LATHES

- 44" Hyde Park Roll Turning
- 90" Putnam Driving Wheel
- Putnam and Niles Axle Turning
- Niles Gap Type Journal Turning
- 60" x 28' Niles, Heavy Forging
- 50" x 50' Pittsburgh Engine
- 48" x 18' American Super-Productive
- 42" x 32' American High Duty
- 36" x 24' Niles "Timesaver"
- 36" x 20' Lodge-Shipley, 18-Speeds
- 30" x 10' American, 12-Speeds
- 24" x 12' American, 12-Speeds
- 20" x 10' Lodge-Shipley, 12-Speeds
- 18" x 6' American, 12-Speeds
- 16" x 6' American, 8-Speeds
- 10" x 20" Monarch "Sensitive Precision"

SIMMONS MACHINE TOOL CORPORATION

MAIN OFFICE AND PLANT: 1721 N. BROADWAY, ALBANY 1, N. Y. NEW YORK OFFICE: 50 EAST 42ND STREET

ENGINEERED *Machine Tool* REBUILDING

LIST OF OLD MACHINES FOR SALE

1. One 6" x .062" combination leveler and cut-off machine with 10 ft. tilting table for light work. (Experimental machine)
2. One #6 Rochester heavy duty High Speed Hammer complete with starter and 5 HP new G.E. motor.
3. One Toledo #613, 42" heavy duty slitter with adjustable 8" cutters, 20 HP new G.E. motor, and 2—sleeves for mounting 8"—slitting cutters for narrow cuts, with knives and spacers.
4. One Winder with slip clutch, 7½ HP motor, and 12" diameter x 28" long collapsible drum.
5. One Cincinnati Centerless Grinder No. H-2005 E, with Emery Wheels and self feed.
6. Five #6 Rochester Heavy High Speed Hammers without motors. Some parts missing, can be supplied.
7. One 24" x 6' gas annealing furnace.
8. One 2 HP portable air compressor.
9. One Morey #2—1942 Turret Lathe.
10. One Cincinnati Automatic bar cut-off machine.
11. One Light Mill Winder for strip steel.
12. One 2"-capacity tube forming machine with several sets forming rolls.
13. One #7 Rochester High Speed Hammer.
14. One 36"-gang slitter for sheets with 5 HP motor.

STEEL PROCESSING CORPORATION

Warehouse & Office
299 Meserole Street, Brooklyn 6, N. Y.
Tel: HYacinth 7-1331

The Company that lists prices for all machines advertised

LATE TYPE MACHINES—PRICED RIGHT

AUTOMATIC, 00G B&S 16000 ser. (1944)	$2950.00
AUTOMATICS (2), 2G B&S 12,000 serials 1½" cap. ('45)	ea. 3950.00
AUTOMATIC, 2½" Cleveland Model B ('42)	3250.00
AUTOMATICS (2), 3¾" Cleveland Model A (1942)	ea. 4950.00
AUTOMATIC, 1⅝" Conomatic 8 sp. (1943)	5500.00
AUTOMATICS (5), #60 New Britain 6 sp. (1943)	ea. 4250.00
AUTOMATIC, 1⅝" Greenlee 4 sp. (1942)	3500.00
AUTOMATIC, 2⅝" Greenlee 4 sp. (1941)	6500.00
CRANE, 3 Ton Shepard, 28' span (1943)	1500.00
DRILLS, (5), #16 Canedy Otto Royal M.D. (1943)	ea. 175.00
DRILL, 3 Sp. Leland Gifford LMS (1943)	695.00
DRILL, 4 Sp. Foote Burt (1943)	1995.00
GEAR SHAPER, Fellows 725 (1943)	2750.00
GEAR GRINDERS, 9" Pratt & Whitney (1943)	ea. 995.00
GEAR GRINDERS, (4), 10" Detroit (1943)	ea. 995.00
GEAR LAPPER, National Broach 15" Red Ring (1941)	1750.00
GRINDER, Surface, Delta 6"x18" M.D. (1947)	395.00
GRINDER, Cincinnati 6"x18" Cyl. (1942)	1450.00
GRINDER, 6 x 30 Cincinnati Cyl. M. D., (1945)	4500.00
GRINDER, Brown & Sharpe No. 5 Cyl. (1943)	1475.00
GRINDER, Cincinnati No. 2 Centerless (1943)	4250.00
GRINDER, Heald No. 72A3 Gagematic (1939)	1750.00
GRINDERS (2), Heald No. 74 Int. Centerless (1943)	ea. 2450.00
GRINDER, Abrasive No. 3 Surface (1939)	995.00
GRINDER, Landis 18-inch Radial Cam (1944)	2950.00
LATHE, Carroll Jamieson 16"x8' (1942)	1750.00
LATHE, LeBlond 13"x5' Rap. Prod. (1943)	1250.00
LATHE, Seneca Falls 8" x60" Low-Swing (1944)	2500.00
LATHE, Monarch EE 10"x20" (1943)	$2450.00
LATHE, LeBlond 36"x60" Centers (1943)	4500.00
LATHES (2), Logan 820, cab. base M.D. (1943)	ea. 375.00
MILL, #12 Brown & Sharpe, M.D. (1943)	1650.00
MILL, Van Norman No. 10CT Contour (1944)	3950.00
MILL, U. S. Multi-Mill MM-1 (1943)	495.00
MILLS (2), Cincinnati 08 Horiz. Rise & Fall M.D. (1942)	ea. 1495.00
MILLS (5), Cincinnati 08 Vertical (1943)	ea. 950.00
MILLS (6), 118 Van Norman (1943)	ea. 950.00
MILL, Stokerunit No. 33 Prod. (1943)	1750.00
PLANER, Cleveland Openside 36x36x8 (new)	12500.00
RIGIDTURNERS (6), Cleveland Model 616 (1943)	2495.00
SAW, Racine Model 6, Hyd. 16' table	ea. 975.00
SAW, Marvel 4B, (1943)	495.00
TAPPER, #2 Bakewell M.D. (1943)	1575.00
THREADER, 1½" Landmaco (1943)	1995.00
TURRET LATHE, Gisholt 1L, Bar feed (1939)	2950.00

MISCELLANEOUS

AUTOMATIC, No. 2G Brown & Sharpe	675.00
AUTOMATIC, 2¼" Cone 4 Sp. M.D.	1475.00
AUTOMATIC, 3¼" Cleveland Model A. 24,000 Ser.	975.00
AUTOMATIC, 4¼" Gridley S.S. M.D.	950.00
CRANE, Shepard 7½ Ton 47' Span	2500.00
DRILL, 36" Reed Prentice	450.00
ELEVATOR, Barrett 1000 lb. 30' Lift M.D.	950.00
GEAR SHAPER, 36" Fellows, M.D.	850.00
GRINDER, 6x32 Norton, M.D.	750.00
GRINDER, 10x52 Landis	750.00
GRINDER, Heald Rotary, 16", M.D.	750.00
GRINDER, Surface, No. 2 B&S, M.D.	475.00
GEAR HOBBER, No. 3 Barber Colman	495.00
LATHE, 14x6 Monarch M.D.	550.00
LATHE, 24x10 Greaves, Grd. Hd., T.A.	1475.00
LATHE, 36"x14' Houston, Grd. Hd., M.D.	1975.00
MILL, No. 5 Cincinnati Plain, SPD	1750.00
PIPE THREADER, 6" Williams M.D.	750.00
SAW, Wells Horiz., Band, M.D.	295.00
THREAD MILL, 6x18 Pratt & Whitney	695.00
TURRET LATHE, 2A W&S, Bar feed	750.00

WRITE FOR COMPLETE LIST!

MALCO *Machinery Company* 739-43 W. VAN BUREN ST. CHICAGO 7, ILLINOIS

NORTON ROLL GRINDER

50" x 28' M.D.
Niles-Bement-Pond 2500 Lb.
Single Frame Steam Hammer
Wire, Write or Phone
AARON MACHINERY CO., INC.
45 Crosby St. New York 12, N. Y.
We. 4-8233

FOR SALE

3—30" Ohio Mill Type Lifting Magnets

arranged for 230 volts D.C. with waterproof stuffing box. Approximate weight each 1,200 pounds.

If interested write

BLAW-KNOX COMPANY
2002 Farmers Bank Building
PITTSBURGH 22, PENNSYLVANIA

FOR SALE

One brand new Model AS Vertical Centrifugal Casting Machine, 5 H.P., driving unit with speed range of 0-600 R.P.M. for operation on 220 volt 60 cycle, 3 phase power, complete with control cabinet. If interested, please reply to

BOX F-819
Care *The Iron Age*, 100 E. 42nd St., New York 17

BORING MACHINERY

2½″ No. 25 T Giddings & Lewis.
3″ bar Universal horizontal.
3″ No. 31 Lucas.
3¾″ No. 32 Lucas horizontal.
3¾″ No. 5A Defiance.
4½″ No. 33 Lucas horizontal.
7″ bar Barrett cylinder boring.
52″ King vertical.
100″ Niles-Bement-Pond, heavy.
24″ & 42″ Bullard vertical.
Vernon vertical jig borer.
Pratt & Whitney jig borer.
No. 42 Heald Borematic, 2 spdl.
Nos. 47A & 48A Heald Borematics.

BROACHES

2 ton American vertical hydraulic.
Twin Ten Oilgear hydraulic.
No. 3XA Oilgear hydraulic.
No. 3 Lapointe screw type.
No. 1 Foote Burt duplex surface.
9 ton American surface.
30 ton No. V48 American surface.

DRILLS, RADIAL

7′-16″ American.
6′-15″ Cincinnati Bickford.
6′-16″ Dreses.
4′ American triple purpose.
4′ Cincinnati Bickford full univ.
4′ Hammond elbow arm.

DRILLS, MULTIPLE AND MISCELLANEOUS

No. B4A Natco multiple.
42 spindle No. B16 Natco.
34 spindle No. 30 Natco multiple.
22 spindle No. 14 Natco multiple.
24 spindle No. 2 Baush multiple.
8 spindle No. 11 Natco multiple.
12 spdl. No. 25 Baush hydr. rail.
12 spindle No. 39 Natco rail.
Baush double end multiple.
No. 15½ Foote Burt hydraulic.
Munson heavy double end borer, centerer, drill or tapper.
No. 4 HH Baker horizontal 2-way.
Barnes 2 spindle deep hole.
5 spindle Detroit horizontal.
No. 30 HO Baker inverted.

MILLING MACHINES PLAIN, UNIVERSAL, VERTICAL

Fray All Angle vertical, hydr. feed.
No. 2-AS Milwaukee plain.
No. 3 Van Norman duplex.
Nos. 3B & 4B Milwaukee plain.
No. 3 Cincinnati universal.
No. 2 Cincinnati vert., rotary table.
No. 2M Cincinnati vertical.
No. 2H Milwaukee vertical, rotary table.
No. 3 Cincinnati vertical, one with rotary table.
No. 3V Van Norman vertical.
No. 3H Milwaukee vertical.
No. 4H Kearney & Trecker vert.
No. 4 Cincinnati high power vert.
Nos. 1-18, 2-18 & 2-24 Cincinnati.

PLANERS

30″ x 24″ x 6′ Liberty openside.
36″ x 30″ x 10′ Cleveland openside.

SHAPERS

6″ Pratt & Whitney vertical.
16″ Gemco.
16″, 20″, 24″, 28″ Gould & Eberhardt.
20″ & 24″ Gemco universal.
24″ Columbia universal.

MILES MACHINERY CO.
SAGINAW, MICH.

GOOD MACHINE TOOLS

LATHES

48″x30′ N-B-P grd. head
42″x32′ N-B-P grd. head
36″x18′ Lodge & Shipley, G. H.
36″x14′ N-B-P, G. H.
24″x21′ American, motorized
24″x11′ Greaves, grd. head
20″x10′ Springfield, G. H.

MILLING MACHINES

#4 Cincinnati, Universal
#4 Cincinnati, Plain
#3 Kempsmith, Plain Maxmiller
2—#2M Cincinnati, Plain
#1B Milwaukee, Plain
#2G Kempsmith, Universal
#3-24 Cincinnati Hydromatic
#000 B & S production

TURRET LATHES

#5 Gisholt, chucking
#4 Gisholt, bar, preselector
#2 Warner Swasey, bar, 12 speed

MISCELLANEOUS

24″ Gemco Shaper, PRT, never used
16″ American Shaper
12″ Hendey Toolroom Shaper
72″ Niles Vert. Boring Mill
60″ Cincinnati Vert. Boring Mill
54″ Colburn-Consolidated Vert. Boring Mill
48″ Colburn-Consolidated Vert. Boring Mill
36″ Rogers Vert. Turret Mill
3″ Universal Horiz. Mill
14″x60″ P & W Hydr. Surface Grinder
12″x36″ Norton Universal Grinder
2″, 4″, 12″ Oster Pipe Machines

EVERYTHING FROM A PULLEY
TO A POWERHOUSE

THE O'BRIEN MACHINERY CO.
105 N. 3d St., Phila. 6, Pa. MArket 7-4180

National High Duty Upsetting & Forg. Machs. guided overarm heading slides, susp. slides, 2″ 3″, 5″, 6″

Ajax Upsetting & Forg. Machs. susp. slides 1¼″, 2½″

Ajax and Acme Upsetters, not susp. slides ¾″, 1″, 1½″, 2½″, 3″

W. W. Bulldozers High Speed #1, #24

W. W. Bulldozers #4, #26, #29

Single and Double End Punches, wide variety of caps and throat depths

Open Back Incl. Presses 8-ton to 50-ton

Solid Back Presses 20 to 50-ton

Trimming Presses 50- to 185-ton

Bradley Hammers, wide variety Upright Helve & Compact

Nazel Air Forg. Hammers #1-B, #2-B, #6-B

K. & R. Angle Bending Roll, 3½x⅜

Ryerson Serpentine Throatless Shear ½″

Bending Rolls 8′, ⅜″, 13′, ⅝″

Niles Plate Leveller 60″x½″

BOLT, NUT & RIVET MACHINERY, COLD HEADERS, COLD BOLT TRIMMERS, THREAD ROLLERS, SLOTTERS, HOT HEADERS AND TRIMMERS, COLD AND HOT PUNCH NUT MACHINES, POINTERS, THREADERS, WOOD SCREW EQUIPMENT

Diamond Face Grinder, Segment Wheel 36″, Table 84x24″, Hydraulic operated

Landis Motor Driven Pipe Threader 8″

DONAHUE STEEL PRODUCTS CO.
1913 W. 74th Street, Chicago 36, Ill.

STOCK TOOLS

Immediate Shipment

BORING MILL, Hor. No. O G & L, M.D.
BORING MILL, Vert. 14′ Niles, M.D.
BROACH, Hor. Hyd., XA Oilgear, 60″ stroke
FURNACE, Elec. 5 Ton
FURNACE, Elec. 10 Ton Heroult
GRINDER, Cyl. 14″ x 72″ Norton, M.D.
GRINDER, Knife, 120″ Springfield, M.D.
GRINDER, Roll, 24″ x 240″ Norton
LATHE, 42″ x 12′ L & S, 84″ c-c, q.c.g.
MILLERS, Pl. Nos. 3, 4 & 5 Cincinnati
MILLER, Vert. No. 4 Kempsmith, table 18″x76″
PRESS, Hyd. 250-Ton Chambersburg, 30″x36″
P & S, No. 11 Beatty, 2½″—1½″
ROLLING MILL, A-12 Ajax, 12″ x 40″
ROLLING MILL, Prec. 3 Stand, 2 Hi, 10″x12″
ROLLING MILL, 1 Stand, 2 Hi, 22″x40″
SAW, Hack, 13″ x 15″ Peerless, M.D.
SAW, No. 3 Ryerson Friction 52″ Blade
SHEAR, Alligator, No. 6½ Mesta, 6½″ sq.
SHEAR, Bar, No. 4 United, 3½″ sq.
SHEAR, Bar, MacIntosh-Hemphill, 2¼″ rd.
SHEAR, Bar Guillotine, 6x1″ alloy steel
SHEAR, Plate, 126″x¼″ United, 30″ Gap
SHEAR, Plate 132″x1½″ Morgan, 26″ throat
SLITTER, Gang, G-36 Yoder, 5 cuts, 11 ga.

FORGING MACHINERY

UPSETTER, 4″ National
UPSETTER, 2″ Acme
UPSETTER, 1½″ Ajax
HAMMER, Board Drop, 1000# B & S
HAMMERS, Pneumatic, Nos. 4B & 6B Nazel
HAMMER, Steam Drop, 2000# Chambersburg
HAMMERS, Steam Forging, 2500, 6000 and 8000 lb. Chambersburg

LANG MACHINERY COMPANY
28th St. & A.V.R.R. Pittsburgh 22, Pa.

ROLL LATHE

18″ Lewis Worm Drive Roll Lathe. Bed 16′6″ long; between centers 10′6″. 6′ table, extra 18″ necking table. Direct coupled 10-15 HP Reliance 230 volt DC motor, 400-1600 RPM. Head has worm and helical gearing. Low speed range 0.711 to 2.844 RPM. High speed range 2.963 to 11.852 RPM. Oil Pump ¾ HP AC. Lathe Serial No. PM8888. Built end 1942. First class condition.

Immediate delivery.

F. H. CRAWFORD & COMPANY, INC.
30 Church Street, New York 7, N. Y.
Phone: COrtlandt 7-2356 Cable: Millequip

10″ x 72″ NORTON Type C Plain Grinder, 1942
12″ x 16″ x 60″ THOMPSON Type C Surface Grinder, 1941
50″ x 17′ cc LeBLOND "Big Swing" Lathe, 1942
Nos. 3, 4, & 5 W&S Ram Type Universal Turret Lathes

Wigglesworth Machinery Company
199 Bent St., Cambridge 41, Mass.

WE MOVE FACTORIES ANYWHERES
MIKE KRASILOVSKY
220 CENTRE STREET, N. Y. 13, N. Y. • Tel. CAnal 6-1130

THE TOOLS YOU WANT — *BUT RARELY FIND*

VERT. & HOR. BORING MILLS

3" bar Univ. Table Type, S.P.D.
3" bar Yoder Table Type, 72" spin. to outer support, 30" spin. to table, 1942
3½" bar Landis #35, Floor Type
4" bar Foote-Burt, hvy., floor type, 1942
4" bar Universal Table Type, 96" spin. to outer support, 60" spin to tbl., 1943
4" bar Lucas #42, Table, 1945
4" bar Landis #40, Floor Type
5" bar Fisher, Floor Type, 1942
6" bar Sellers, Floor Type, 1942
No. 25T G & L Table, 2½" bar, '42
30" Colburn, 1 turret head, M.D.
36" Bullard Spiral Dr., 4 Jaw, Coolant
36" King Side Hd., 1942
42" King Side Hd., 1943
48" N.B.P. Car Wheel
No. 49 Heald Borematic, dble. end, 6 spin., late
72" Cinci., Rapid Production, M.D.
84" Cinci. Massive Type, P.R.T.
10-16' Betts Ext. Type, AC, M.D.
12' Betts, 2 hds., M.D.

LATHES

No. 4 B LeBlond Boring, Capty. 28' & 20'6" (2), 1942
14/16½" x 54" centers Sidney, T.A.
14" x 30" cc Reed-Prentice Tool Room
No. 16 LeBlond Auto. Production, 1942
16/18½" x 28" centers Monarch, T.A.
16/18½" x 54" centers Reed-Prentice, TAPER ATTACHMENT, 1942
18"/20½" x 54" centers LeBlond, late
18/36" x 8' Fay Scott, Gap Q. C. G., M.D.
18" x 120" centers Amer. T. A., Cone, M.D.
25" x 18' Bed LeBlond, M.D.
28"/48" x 14' Harrington, sliding bed gap
30" x 12' Bed LeBlond, T.A., M.D.
30" x 18' Lehmann T. A., '43
36" x 32' Bed N.B.P., 2 carr., T.A.
48" x 20' centers Niles, Grd. Hd., M.D.
48" x 20' centers Simmons, Grd. Hd., 1942
50" x 17' centers LeBlond, 1942
60' x 45' centers MacIntosh Hemphill, 1942

TURRETS & AUTOMATICS

No. 3A W&S, 6¼", chuck, T.A., '46
No. 5 J&L, Univ., late
No. OG B&S Auto., late
Nos. 5 & 3 W. & S. Univ., late
No. 1 B. S. Screw Mach., new 1945 (3)
Nos. 4 & 2 W. & S. Univ., late
No. 1L Gisholt Univ., New 1942 Bar
No. 4 Gisholt Univ., Bar, 1942
1½" Oster No. 601 Turret
No. 5 D-2 Potter & Johnston '42
No. 4H-12" Libby Slid. Bed Gap (5)
1⅝" Conematic, 8 spin. (4)
1⅝" New Brit. Gridley, 6 spin., late (2)
2⅝" Acme-Gridley RB8 Automatic, 8 spin., '44
Model 65 New Britain-Gridley 6 spin. Work rotating type, new 1943
No. 9DT Potter Johnston Automatics (2)

RADIAL DRILLS

5' 13" col. Morris, 1945
3' 11" col. Fosdick, 1943
No. 3BL Natco, 24 spin., 1943
2-B-8 Edlund 8", 1 spin. (2), 1942
2½' Amer. Tri. Purp., 9" col., M.D.
3 Spin. Leland-Gifford, #1 LMS, 1943
6' Amer. Tri. Purp., 16" col., M.D.
7' Carlton, 17" col., 2' extra high, 1943
21" Royersford, M.D., new
42" Baush Radial Tapper, ½" capty., 1941
No. 513 Baker, Heavy, 15 H.P.

MILLING MACHINES

No. 0 Brown & Sharpe, M.D.
No. 1A Simmons, Microspeed, M.D.
No. 2 Van Norman Duplex
4" Rice Barton Spline, 1942 (2)
12" x 102" Lees-Bradner Thread Miller
1848 K. & T. Simplex, 1944
24" x 24" x 16' Ingersoll Planer Type, 4 swivel hds., 20 h.p., AC, M.D.
#1—8 Kent Owens, Hyd.
#2H K. & T. Vert.
#2A B. & S. Univ., 1942
#4 Kempsmith Maxi-Mil, Vertical
No. 36 Van Norman, late
No. 4K K&T Hor., 1943

GRINDERS

60" P. & W. Vert. Surface, 1942
#42 Heald Borematic, Lathe
#47A Heald Borematic, Lathe
24" x 240" Norton Cyl., M.D.
17" x 28"-40" Norton Crankpin Dbl. Hd.
10" x 24" Landis Univ., Hyd., 1942
10" x 36" Norton Surface, 1943
No. 72A5 Heald Plain Internal, 1943 (8)
8" x 48" J. & L. Thread, 1941
6" x 18" Norton, Pl. Hyd.. Late
Nos. 35 & 31 Excellos (2)
No. 2 Cinci. Centerless, late
No. 81 Heald Int. Centerless

PLANERS

24" x 24" x 16' Ingersoll Planer Type, 4 swivel hds., 20 H.P., A.C., M.D.
24" x 24" x 10' Whitcomb, 2 Hds., M.D.
24" x 24" x 66" Rockford Hydr. Shaper-Planer, 2 hds., late
30" x 30" x 10' Whitcomb, 2 Hds., M.D.
36" x 36" x 12' Cinci. Hypro, 4 hds., var. voltage, AC dr., 1943
36" x 36" x 12' Woodward Powell 4 Hds., M.D.
36" x 36" x 18' Cleveland Openside, 3 Hds.
42" x 18" x 16' N.B.P. Frog & Switch with 50 h.p., AC., M.D.
42" x 42" x 10' Cleveland Open, 3 hds., M.D.
48" x 48" x 26' N.B.P., 4 hds.
48" x 48" x 16' Gray, 1942
54" x 48" x 16' Niles, 4 Hds., Rev., M.D.
60" x 60" x 26' N.B.P., 4 hds.
84" x 84" x 26' Betts, 4 hds.

PRESSES, PUNCHES, ROLLS SHEARS

Multi Punch, No. 7 H. & J., 14" throat
#20 Bliss O.B.I.
250 ton WATSON STILLMAN HOR. HYD. CRANKPIN AND FORCING PRESS
56 ton Diamond Grd. O.B.I., new, M.D.
55 ton Diamond Fly, O.B.I., new, M.D.
31 ton Diamond Grd. O.B.I., new, M.D.
30 ton Diamond Fly, O.B.I., new, M.D.
72" Clev., S.E. Punch, 1¼" x 1"
36" x 16 Ga. Niagara, 18" Gap
10' x ¾" Hilles & Jones 7 Roll Straightener, AC., M.D., late type
15' x ¾" Wickes Pyr. Rolls, M.D.
10' x ½" N.B.P. Rolls, Pyr., AC., M.D.

MISCELLANEOUS

GEAR SHAPER, No. 75 Fellows
HAMMER, Board Drop, 5000# Chambersburg, 1943
HAMMER, 2500 lb. Chambers Double Frame, Drop Forge, air operated
HAMMERS #4B & 4-1, Nazels, M.D.
KEYSEATER, No. 0 Baker, M.D.
KEYSEATER, No. 5 M. & M.
SAW, 6" Royersford, M.D., new
No. 24ML Duall Saw
SHAPER, 24" Milwaukee Motorized
SLOTTER, 20"-24" Dill, M.D.
SLOTTER, 48" N.B.P., grd., late

CABLE ADDRESS—
Benmachine, New York

BENNETT MACHINERY CO.

30 CHURCH ST.
NEW YORK 7, N. Y.

PRACTICALLY NEW

2 — FEDERAL SEAM WELDERS

200 KVA, 60 CYCLE,
440 PRIMARY VOLTAGE

(1) Straight in feed, 45" x 3.5" Throat
(1) Cross Through Feed, 45" x 3.5" Throat Depth

AIR OPERATED PRESSURE TO ROLLS
COMPLETE WITH GE THYRATRON SEAM WELDING CONTROLS

PRICE .... $1,500.00 EA.

WINSTON MACHINERY CO., INC.
517 SOUTH DELAWARE STREET
INDIANAPOLIS 4, INDIANA

NEW — SURPLUS

HIGH SPEED DRILLS

TAPER OR STRAIGHT SHANK

1/2"	$1.41 ea.	43/64"	$2.50 ea.	27/32"	$3.64 ea.
33/64"	1.55 ea.	11/16"	2.50 ea.	55/64"	3.83 ea.
17/32"	1.55 ea.	45/64"	2.74 ea.	7/8"	3.83 ea.
35/64"	1.79 ea.	23/32"	2.74 ea.	57/64"	4.02 ea.
9/16"	1.79 ea	47/64"	2.97 ea.	29/32"	4.02 ea.
37/64"	1.90 ea.	3/4"	2.97 ea.	59/64"	4.21 ea.
19/32"	1.90 ea.	49/64"	3.09 ea.	15/16"	4.21 ea.
39/64"	2.02 ea.	25/32"	3.09 ea.	61/64"	4.59 ea.
5/8"	2.02 ea.	51/64"	3.45 ea.	31/32"	4.59 ea.
41/64"	2.26 ea.	13/16"	3.45 ea.	63/64"	4.87 ea.
21/32"	2.26 ea.	53/64"	3.64 ea.	1"	4.87 ea.

12 or more drills—10% discount

VICTOR MACHINERY EXCHANGE, INC.
251 CENTRE ST., N.Y.C.

HEAVY EQUIPMENT FOR SALE

AJAX 1½", 3½" Upsetter and Forging Motor Drive
BIRDSBORO 325 Ton Vertical Press Hydraulic New 1942
BULLARD 16 6-spindle Multaumatic New 1943
CLEARING 50 Ton Hyd. Press New 1940
CRANES from 5 to 30 ton cap. 230 volts DC
DILL 20-24" Vertical Slotter Motor Drive
LAKE ERIE 500 Ton Vertical Press Hyd. New 1944
LEBLOND #2 Rifling & Reaming Machines
NILES 600 Ton Horiz. wheel press Motor Drive
NILES 100" Vertical Boring Mill 2 swivel heads, MD
NIAGARA 1000, 1200 KVA Transformers
QUICKWORK ¾", 1" cap. rotary shear Motor Drive
UNITED ENG. 2,000-ton Hyd. Steam

HARRISON MACHINERY EXCHANGE, INC.
South 4th St. Harrison, N. J.
Tel.: HUMBOLDT 2-5750: 2-5775

LOOKING FOR . . . **BUSINESS OPPORTUNITIES?**
NEED . . . **CONTACTS or CAPITAL?**

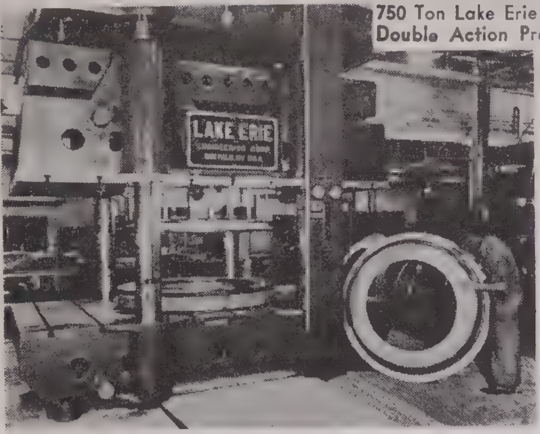
Read the Classified Section of
THE IRON AGE

FOR SALE

1—Electrically operated Pipe or Rod bending machine, with 5 H.P. Motor. Perfect condition.

1—Gasoline Driven Dump Buggy on solid rubber.

UNIVERSAL MACHINERY AND EQUIPMENT CO.
320 East Broad St. Shillington, Reading, Pa.


750 Ton Lake Erie Double Action Press

• SPOT DELIVERY •

LAKE ERIE HYDRAULIC PRESS!

750 TONS • AGE 1942

DOUBLE ACTION

Will draw and lift out 22¾"

Bed area 81½ x 146" F.B. xL.R.

Strokes outside & inside ram adjustable up to 46"

Complete with Vickers Pumps, motors 10 & 40 H.P.
3/60/220 AC and Automatic controls

Overall height 20½'. Weight 75 Tons

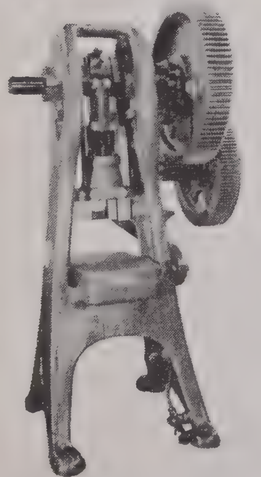
ORNITZ EQUIPMENT CORP.

Industrial Engineering Service

1775 Broadway, New York 19, N. Y. Phone—Plaza 7-3470

WORLD'S LARGEST STOCK

PRESSES



DG-53, DG-54, DG-55 FERRACUTE PRESSES

AT SPECIAL LOW PRICES

HUNDREDS OF OTHERS IN STOCK

JOSEPH HYMAN AND SONS

Tioga, Livingston & Almond Sts.
PHILADELPHIA 34, PA.

HORNING PRESSES

REBUILT GUARANTEED

(3) #14 Toledo, flywheel type, 3" stroke, swinging adjustable table, 30 ton cap. special flanged ram 8" x 24", belt drive.

(1) #14 Toledo, flywheel type, 3" stroke, vertical adjustable table, 30 ton cap. standard ram, belt drive.

HAHN & BRANDT MACHINERY CO.

#465 N. 5th St. Phila. 23, Pa.

RE-NU-BILT

Guaranteed

ELECTRIC POWER EQUIPMENT

A.C. MOTORS

3 phase — 60 cycle

SLIP RING

Qu.	HP	Make	Type	Volts	Speed
1	1000	Whse.	CW	2300	720
1	900	G.E.	IM	2300	880
2	700	Whse.	CW	2200	900
1	500	G.E.	IP	550	505
1	400	G.E.	IM	2200	252
3	350	Whse.	CW	2200	900
1	350	G.E.	MT-442Y	2200/4000	253
1	300	Al. Ch.		2300	505
1	300	Whse.	CW-885	440	1750
1	250	G.E.	MT-563Y	550	880
1	250	G.E.	MT-424Y	4000	257
1	250	G.E.	MT-5598	2200	1800
1	135	G.E.	IM	2300	708
2	100	G.E.	IM	2200	435

SQUIRREL CAGE

Qu.	HP	Make	Type	Volts	Speed
1	250	G.E.	KT-559	440	1750
1	200(NEW)	G.E.	K	2300	1200
1	200	G.E.	IK	550	865
1	125(NEW)	G.E.	KF-TEFC	440	1190
2	100	G.E.	KT-543	220/440	1750

SYNCHRONOUS

Qu.	HP	Make	Type	Volts	Speed
2	3500	G.E.	TS	2300	257
1	2100	G.E.	ATI	4600	514
2	2000	Whse.		2300	120
1	1000	Whse.	Mill	2300	189.5
1	900	Al. Ch.		2200	150
1	600	Whse.		440	360
2	500	G.E.	TS-9832	4160	600
2	450	Whse.		2300	1800
2	350	G.E.	TS	2200	150
1	320	G.E.	ATI	2300	600
1	300	G.E.	ATI	440	720

BELYEA COMPANY, INC.

47 Howell Street, Jersey City 6, N. J.

BARGAINS FOR SALE
100 KW. DIESEL ENGINE
GENERATOR SETS

15—100 KW. 120/240 V.D.C. Delco Generators dir. con. to 150 HP., Model GDB-8, 5½x7, 8 cyl. Superior Diesel Engines, electric starting with muffler, power panel and accessories.

2—100 KW Delco 220/440 v. 3 ph. 60 cy. AC Units same as above.

PRACTICALLY AS GOOD AS NEW
ONLY USED FOR SPARES

Duquesne Electric & Mfg. Co.
Pittsburgh (6), Pa.

D. C. MOTORS & GENERATORS, Etc.

GENERATORS

Kw.	Make	Voltage	Speed
500	West.	250	1100
330	Elliott	250	1200
300	G.E.	250	1200
300	Al.Ch.	250	1200
250	G.E.	125	720
200	G.E.	250	1200
200	Cr.Wh.	600	900
150	West.	250	900
150	West.	250	1200
150	Cr.Wh.	125	1200
150	West.	125	1200
100	West.	125	900
100	G.E.	125	1200
100	El.Mchy.	125	1200

MOTORS

Hp.	Make	Voltage	Speed
765 (6)	G.E.	550	1045/1350
300	West.	125	900
150	G.E.	230	800
100	Rel.	230	400/1200
100	G.E.	250	400/1200
100	G.E.	250	1750
100	Cr.Wh.	125	900
75	G.E.	230	500/1500
75	Cr.Wh.	230	375/750
75	West.	230	635
60	West.	230	680
60	G.E.	230	480/1100
50	West.	230	500/1500
50	West.	230	750
50	West.	230	585
50	West.	230	250/1000
40	G.E.	230	400/1500
40	Rel.	230	400/1200
40	West.	230	1750
40	Century	230	1750

D. C. AUTOMATIC STARTERS

600	West.	230
300	West.	125
100	G.E.	230

D. C. HOISTS

17—New—2 ton Shepard-Niles—230 Volts

Send for our complete list No. 19

L. J. LAND, INC.
Established 1910
150 GRAND STREET, NEW YORK 13, N. Y.
Canal 6-6976

Bliss No. 1½, 1½B, 3½A, 3½B, 3½C, 4 & 16 Toggle Draw Presses all with Friction Clutches

Cincinnati 36" x 36" x 16 ft. Planer, M. D.

Lewis Nos. 3F & 4F Straighteners & Cutters

Lucas No. 43 Precision Boring Mill, M.D.

National Auto. Nut Tappers—¼", ⅝" & ⅞" cap.

Waterbury Farrel Cold Headers & Thread Rollers, Nos. 10, 20, 30, 40 & 50.

Woodward & Powell 42" x 42" x 36 ft. Four Head Planer.

National Machinery Exchange, Inc.

128-138 Mott Street New York, N. Y.
"IF IT'S MACHINERY, WE HAVE IT"

MOTORS, GENERATORS, TRANSFORMERS

1 — 1500 H.P.
Bought and Sold
New and Rebuilt

ELECTRIC EQUIPMENT CO.
ROCHESTER 1, N. Y.

MOTORS—CRANES—M. G. SETS

In Stock—Immediate Shipment—Rebuilt and Guaranteed

OVERHEAD ELECTRIC TRAVELING CRANES

Tons	Make	Span	Current
5	Shepard	68'2"	115-VDC.
(With above 146'0" A-Frame Steel Runway)			
7½	Erie	78'0"	220-VAC.
(With above 250'0" A-Frame Runway)			
10	Northern	37'11"	230-VDC.
10	Cleveland	59'0"	230-VDC.

SQUIRREL CAGE MOTORS

3-PHASE 60-CYCLE

Qu.	H.P.	Make	Type	Volts	RPM.
2	40	Al. Ch.	AR	440	860
1	40	Master	PA-445	440	1200
3	50	Whse.	CS	440	690
1	50	F.M.	H-16-A	440	900
1	50	Al. Ch.	AR-220D	440	1155
1	50	Ideal	AT-445	440	1750
1	60	Whse.	CS-607	440	880
1	75	G.E.	KT-356	440	860
1	75	G.E.	KF-542	440	1200
1	75	Whse.	CS	440	1750
1	75	Al. Ch.	AR	2300	1765
5	100	F.M.	HS-201C	440	880
1	106	Whse.	CS-766	2300	1170
2	100	G.E.	KT-556	2200	865
1	100	G.E.	K-544	2300	1175
1	100	Al. Ch.	AR	2200	1160
1	100	G.E.	I-K	440	1800
3	100	Whse.	CS-663	440	1750
2	125	Al. Ch.	AR	440	435
1	125	Whse.	CS-761	440	1750
1	125	Whse.	CS-7728	2200	1170
1	150	G.E.	I-K	440	690
1	150	El. Mchy.	B.B.	440	1200
1	150	Whse.	CS-7729	2200	1170
1	200	Al. Ch.	AR	440	600
1	250	Whse.	CS	2200	1200

SYNCHRONOUS MOTORS ALTERNATORS

3-PHASE 60-CYCLE

Qu.	HP.	Make	P.F.	Volts	RPM.
1	30	Whse.	.8	220	1800
2	50	G.E.	.8	2200	600
1	60	G.E.	.8	440	1200
2	100	G.E.	.8	440	600
1	100	Ideal	.8	220	900
1	100	Whse.	1.0	2200	1200
3	100	Whse.	.8	440	1800
1	125	G.E.	.8	2200	900
1	150	G.E.	1.0	2300	900
1	220	G.E.	.8	480	720
1	400	Whse.	.8	440	600

3 new G.E. generators 1000 K.V.A. or 1250 H.P. Syn. Motor: 4160/2300 v 3 p 60 cy. 900 R.P.M. 1.0 PF dir. con. exciters.

MOTOR GENERATOR SETS

Qu.	KW	Make	RPM.	Volts D.C.	Volts A.C.
1	5½	G.E.	1800	250	220/440
1	9	G.E.	1800	250	220/440
7	25	Whse.	1200	120/240	220/440
3	50	Whse.	1200	120/240	440/2300
2	35	G.E.	1800	125	220/440
1	50	Lo. Al.	1200	120/240	440/2200
1	75	Whse.	1200	125	220/440
1	75	Al. Ch.	900	250	2200
1	100	G.E.	1200	250	440/2300
1	100	C.W.	1200	250	440/2300
3	150	C.W.	1200	300	440/2200
1	300	Whse.	1200	125/250	2300
1	400	Whse.	720	550/275	2300
1	600	G.E.	720	300	2200
2	1000	G.E.	514	600	4150/2300

G.E. Rotary Converter, 2025/2565 KW, 225/285-VDC., 450-RPM., complete with A.C. and D.C. panels and control, 2760 K.V.A. transformer, OISC, 6900-V., 3-Ph., 60-Cy.

SLIP RING MOTORS—CONSTANT DUTY

3-PHASE 60-CYCLE

Qu.	HP.	Make	Type	Volts	RPM.
4	25	G.E.	MT-526	440	840
1	25	G.E.	MT-332	2200	850
2	25	Whse.	CW-4810	220	1750
1	30	Whse.	CW	440	1160
1	40	Al. Ch.	ARY	2200	435
3	40	G.E.	MT-346	550	560
3*	40	G.E.	I-M	600	1170
1	50	Al. Ch.	ARY	2200	490
2	50	G.E.	MT-536	2200	1150
1	75	G.E.	I-M	220	695
1	100	Whse.	CW-854C	550	690
1	125	Al. Ch.	ARY	440	900
1	150	G.E.	I-P	440	1180
1	150	G.E.	I-M	2200	1750
1	200	G.E.	I-M	2200	600
1	200	Al. Ch.	ANY	2200	600
1	250	Whse.	CW-1106	2200	580
1	300	Al. Ch.	ANY	2200	505
1	300	G.E.	I-M	2200	1200
1	400	G.E.	I-M	2300	900
1**	450	G.E.	MT	2200	257
1**	600	G.E.	MT-412	2200	719
1**	750	G.E.	MT-414	2200	709
1**	1200	Whse.	CW	2200	590

*—40-Cy. **—Mill Type 2-Pedestal bearing on cast iron base, complete with REVERSING PRIMARY and MAGNETIC SECONDARY CONTROL.

TRANSFORMERS (OIL-COOLED)

Qu.	K.V.A.	Make	Voltage	PH.	CY.
1	25	Al. Ch.	2300-460/230	1	60
3*	37.5	Whse.	460/230-230/115	1	60
3	50	Al. Ch.	22000-220	1	60
2	50	Wagner	13200/11880-575/287	1	60
14 (New)	100	G.E.	4330/4160-125/250	1	60
3	130	G.E.	19000/9500-2200/550	1	60
3 (New)	150	Wagner	8800/4400-2300	1	60
3	667	G.E.	2300/4000Y-460	1	60

T. B. MAC CABE COMPANY

4302 CLARISSA STREET PHILADELPHIA, PENNA.

FOR SALE

Wellman Engineering Co. single drum hoist, 10' in diameter, 7' face, 1 5/16" between peaks, 5½" flange, 1¼" rope, 870' per minute complete with a 400 H.P. Westinghouse motor, 2200 volts, 3 phase, 60 cycle, 350 RPM, type HP and G. E. automatic control CR2124 for mine hoist service, 2200 volts, 400 H.P.

GAVENDA BROTHERS, INC.
352 South Second Avenue, Canton, Illinois
Telephones 739 and 2438

COMPRESSORS — VACUUM PUMPS
STATIONARY — PORTABLE
ELECTRIC — GAS — DIESEL — STEAM
SALE OR RENT
New or Guaranteed Rebuilt
AMERICAN AIR COMPRESSOR CORP.
48th STREET & DELL AVENUE
NORTH BERGEN, NEW JERSEY
Telephone: Union 5-4848

KNOX

REBUILT

AIR COMPRESSORS

FULLY GUARANTEED

EARL E. KNOX COMPANY
1111 BACON ST. ERIE, PA.

ELECTRIC CRANES and HOISTS

N. B. PAYNE & CO., INC.
105 W. 55 St., New York 19
Tel. Circle 76730

1—10,000# new Shepard Form 23, Motor Driven Trolley Hoist PB control for 220 AC.
1—5 ton Alliance Gantry Charging Crane, 20' span for 220 volts DC.
1—10 ton Morgan OET Cab Controlled Crane, 50' span, 220 DC.
1—35 ton Ditto, 70' span.
1—15 ton Ditto.
1—2000# Cap. Shepard New Form 8 Elec. Hoist for 110/1/60 AC.
1—30 ton Cap. Hand powerhouse Crane, 40' span, very good condition.
1—880 KW Nordberg Westinghouse Diesel Generator Set for 2400/3/60 AC, comp. Very good condition.
1—850 KW Nordberg GE, ditto.
1—400 KW Nordberg Fairbanks Morse Diesel Generator, ditto.

HAWKINS & COMPANY
130 S. MICHIGAN AVENUE, CHICAGO 3, ILL.
Ph: Har. 0725

MACHINES FOR RENT

We have for rent fifteen late model crawler cranes, from 5 to 40 tons capacity—also clamshell and dragline buckets, wrecking balls, hook blocks, over haul balls and all other crane accessories

TRACTOR & EQUIPMENT CO.
3507 W. 51st ST. CHICAGO 32

OVERHEAD CRANES & HOISTS

1—25-35 ton Morgan 10 ton auxiliary, 60'0" span, 230 volts D.C. Reconditioned 1941.
25 Electric Hoists 1000# to 15-ton capacity, monorail type, 220/3/60 or 230 VDC.
Will sell as is or reconditioned. Single and 2 motor.

Write for special list cranes and hoists

JAMES P. ARMEL
710 House Bldg. Pittsburgh 22, Pa.
Tel.: Grant 4449

CRANES—FOR SALE—*Bargains!*

MILWAUKEE 5 ton; 25' span; 230 volts DC
MILWAUKEE 5 ton; 37'2" span; 230 volts DC
MILWAUKEE 10-ton; 36' span; 230 volts DC
MILWAUKEE 25-ton; 34'4" span; 230 volts DC

HARRISON MACHINERY EXCHANGE, Inc.
So. 4th Street Harrison, N. J.
HUmboldt 2-5750

FOR SALE — *NOW*

10 TON OVERHEAD ELECTRIC TRAVELING CRANE

3 MOTORS—A. C.
60 Foot SPAN
CAB OPERATED

Bridge Motor — 20 H. P.
Bridge Speed — 450 feet per minute
Hoist Motor — 20 H. P.
Hoist Speed — 50 feet per minute
Trolley Motor — 3 H. P.
Trolley Speed — 125 feet per minute

Manufactured by—Ohio Crane and Engineering. 9 months old—can be seen in operation at

LAFAYETTE STEEL COMPANY
13501 Sanders Ave. Detroit, Mich.
Phone: Townsend 9-8400

LIFTING MAGNETS

18", 20", 29", 36", 45", 55", also rectangular magnets, generator reels, controllers.

New magnets also

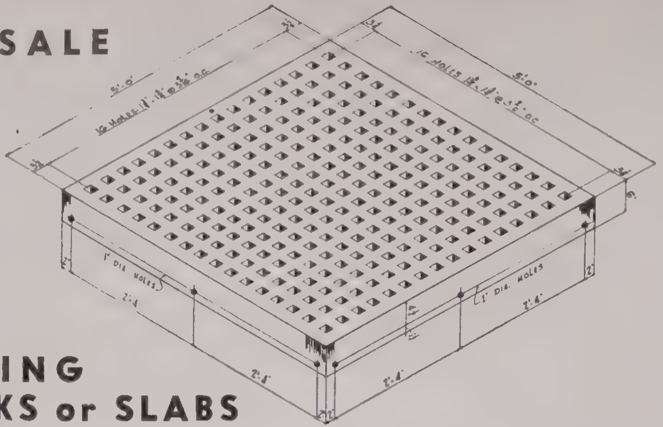
Goodman Electric Machinery Co.
1060 Broad St. Newark 2, N. J.

---

1 — 45" CUTLER-HAMMER MAGNET used Approx. 3 Months.
1—48" CANTON SHEAR equipped with 3 phase 220 or 440 Volt GE Motor for shearing auto body stock and other sheets. Practically new.

MICHIGAN FOUNDRY SUPPLY CO.
1352 Division St., Muskegon, Mich.

FOR SALE



BENDING BLOCKS or SLABS

These blocks or slabs are 5 ft. x 5 ft. as shown. They are semi-steel, in good condition, having only been slightly used on a war-time contract in a shipyard. They are very useful for many purposes, such as for bending table, for layout & assembly work, etc. We also have stands for single blocks, and multiple stands to carry 2, 4, or 8 blocks. We can sell the blocks with or without the stands.

Orders accepted for single blocks or large quantities, as desired.
Write, Phone or Wire at Once!

ACORN IRON & SUPPLY CO.
Phone: WAlnut 2-7070
Delaware Ave. at Poplar St.
Philadelphia 23, Pa.

WE OWN AND OFFER

FOR SALE

IMMEDIATE DELIVERY

NEW PLAIN HOT ROLLED, ANNEALED MILD STEEL SHEETS

- Approx. 180 Tons—12 ga. x 36" x 96"

CARBON = .12 max.

NEW HOT ROLLED MILD STEEL PLATES

- Approx. 280 Tons—3/16" x 5' x 15'

CARBON = .12 max.

FABRIKANT
STEEL PRODUCTS, Inc.
50th Floor—Woolworth Bldg.
NEW YORK 7, N. Y. - BEekman 3-3041
Cable Address: FABKANT, New York
MEMBER: Association of Steel Distributors

Inquiries for

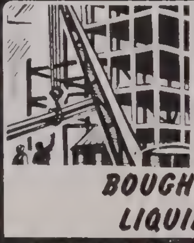
Large Diameter Welded Pipe to API specifications

solicited by

KURT ORBAN CO., INC.
21 West St., N.Y.C.

on behalf of

STAHLUNION-EXPORT GMBH
OF DUESSELDORF



RAIL
STEEL PLATE
STRUCTURALS, PIPE,
TUBING, WIRE ROPE,
FERROUS AND NON-FERROUS SCRAP

BOUGHT-SOLD LIQUIDATED

DULIEN STEEL PRODUCTS, Inc.
of Washington
9265 E. Marginal Way • Seattle 8, Wash. • LAnder 6000

TANKS

10,000 Gallon R. R. tank car tanks

FREIGHT CARS
CAR PARTS, RAILS

•

Consolidated Ry. Equipment Co.
6702 So. Cicero Avenue, Chicago 38, Illinois

WROUGHT
Steel Pipe
FITTINGS
VALVES
BOILER
TUBES

ALBERT & DAVIDSON
PIPE CORPORATION
2nd AVENUE . . 50th-51st STREET
BROOKLYN 32, N. Y.
Windsor 9-6300

PIPE

VALVES and FITTINGS
All Sizes in Stock
NEW-USED

GREENPOINT IRON & PIPE CO. INC.
Bogart, Stagg & Meadow Sts. Brooklyn, N.Y.

BARON STEEL Co.

4075 DETROIT AVE., TOLEDO 12, O.

BARS · SHAPES · PLATES

For Sale — 500 Tons

WROUGHT IRON PLATE

Thickness: 3/16—¼—5/16—⅜—½"
Size (48" to 54" wide) (9' to 12' Long)
Excellent Condition—Delivery in 2 Weeks
Location—NW Ohio

Attractive Price to End Users—Inspection Invited
P. O. Box 1313 Chicago 90, Ill.

PLASTIC SLEEVES

For hydraulic tubing - Printed to A-N specifications. Used by aircraft, household appliance, radio manufacturers, and metal and wire industries. A new, exclusive Topflight item.

TOPFLIGHT TAPE CO. YORK PA.

CONTINUOUS SUPPLY
EUROPEAN
HOT ROLLED MILD
STEEL SHEETS
GAUGES 14-30
ALSO RODS, BARS & TUBING
JAPANESE
COLD ROLLED STEEL SHEETS
GAUGES 18-24
EUROPEAN
15,000 METRIC TONS
PIG IRON
DELIVERY 5000
TONS MONTHLY

INTERPORT
COMMERCIAL CORP.
580 Fifth Ave. N.Y. 19, N.Y.
Plaza 7-0610
Teletype N.Y. 1-1495 Cable "Multiport"

FOR SALE—SPEED REDUCERS

1—new 500 HP at 514 input, class 2, Farrel-Birmingham 5 to 1 ratio herringbone speed reducer, 1945 model SRH, 30" center.

1—used 400 HP at 600 input, class 2, Fawcus heavy mill type herringbone reducer, 7 to 1 ratio, 36" centers.

1—mill or conveyor drive 150 HP, 860 rpm, Allis Chalmers, 440 volt, 3 phase, 60 cycle slip ring motor and Cleveland worm reducer, ratio 10¼ to 1, a used unit but in good condition.

STEWART BOLLING & CO., INC.
3190 East 65th Street, Cleveland 4, Ohio

FOR SALE

Wells #8, ¾" Wire Straightener

200# electric steel melting furnace. Two 50,000# Aetna Standard drawbenches, one complete with electrical equipment. One Brightman bar turning machine.

MONARCH STEEL COMPANY, Indianapolis

1—Ajax Type T-60 Electric Furnace with 20 KW Converter for 1 phase, 60 cycle, 440 volt operation, complete with transformer and controls.
1—5 H.P. Type C McKee Off-On Steam Boiler—Gas fired with Electric Controls.

Both slightly used—excellent condition.

THE STANDARD LIME AND STONE CO.
2000 1st National Bank Bldg., Baltimore 3, Md.
Plaza 1646—Phone

FOR SALE

Model 600 DeLaval Clarifier for $250.00 F.O.B. our Plant — Not crated. Suitable for removing particles from waxes or liquids.

R. E. WORDEN, Dictaphone Corporation
375 Howard Avenue, Bridgeport 5, Conn.

UNUSUAL OPPORTUNITIES
can be found each week
in the
CLASSIFIED SECTIONS
of
THE IRON AGE

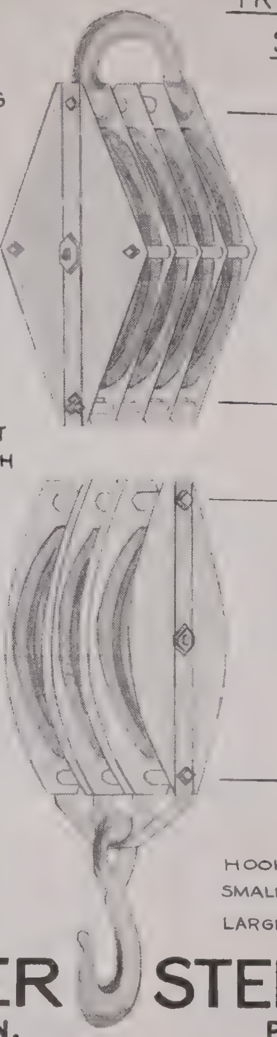
BLOCKS

TRIPLE & QUAD. SHEAVES

SELF LUBRICATING
BRONZE BUSHED

NEW

PACKED SEPERATELY
IN SOLID WOOD BOXES


OPENING 5⅜", 1½"ϕ ROD
SECURED BY 1½"ϕ PIN
4 - 16"ϕ WHEELS, 1½"ϕ PIN
2 - ¾"ϕ CENTER RODS
WITH SPACERS
ALL STRAPS ½"×3½"
5 - ¼" DIAMOND PLATES
SHIPPING WT. = 406 LBS
3 - ¾"ϕ RODS WITH SPACERS
¾"ϕ ROD W. SPACERS
3 - 16"ϕ WHEELS, 1½" PIN
ALL STRAPS ½"×2½"
6 - 5/16" OVAL PLATES
SHIPPING WT. = 395#
¾"ϕ ROD W. SPACERS
⅜"×2½" CENTER STRAP
HOOK
SMALLEST OPENING 3¼"
LARGEST OPENING 4½"

PRICED ORIGINALLY AT
OVER $ 100.00 EACH

OUR PRICE
TRIPLE, $45.00
QUAD, $45.00
IN LOTS OF ONE (1)
OR MORE

GLAZER STEEL CORP.
KNOXVILLE, TENN.
PHONE: 48601

IMMEDIATE DELIVERY

FROM STOCK

182 Pcs.	4" W.F. Beams	13.8#	40'0"
429 Pcs.	6" W.F. Beams	20#	40'0"
280 Pcs.	8" W.F. Beams	31#	40'0"
51 Pcs.	10" W.F. Beams	49#	40'0"
38 Pcs.	12" W.F. Beams	65#	40'0"
32 Pcs.	14" W.F. Beams	115#	55'0"
32 Pcs.	14" W.F. Beams	115#	55'0"

LARGE TONNAGE, BEAMS, CHANNELS, ANGLES, PLATES AT BOTH OUR EAST COAST AND WEST COAST WAREHOUSES

LONG ISLAND BEAM CO.
39-25 21 St., Long Island City 1, N. Y.
Stillwell 6-5900-1-2-3

FOR SALE

TRACK SCALE

120 ton Fairbanks Morse Standard Gauge Type P-10-60, Platform 48'

IRON & STEEL PRODUCTS, INC.
13496 S. Brainard Ave., Chicago 33, Illinois
"*ANYTHING* containing IRON or STEEL"

ACCUMULATOR—LOCOMOTIVES—MISC.

1—SOUTHWARK 24" x 15' 1500# Accum., Moving Ram, Latest Type—Like New.
1—SOUTHWARK Draw Bench, 200 x 90 x 9'.
1—DAVENPORT 45 Ton Diesel Elec. Loco. $2377.
1—VULCAN 35 Ton Diesel Loco. $4249.
1—BALDWIN 50 Ton Steam Saddle Tank—36" Ga.
1—AMERICAN 70 Ton S.L. Derrick—110' Boom.
1—PLYMOUTH 14 Ton 36" Ga. Gas Loco.

CHARLES DREIFUS CO.
PSFS Bldg., Phila., Pa. Tel. WAlnut 2-5050

"Largest Inventory Small Diameter Wire Rope Cable in America"

SURPLUS
PURCHASED FROM THE GOVERNMENT
25,000,000 FT.
PREFORMED
WIRE ROPE CABLE

MANUFACTURED BY AMERICA'S FOREMOST WIRE ROPE MANUFACTURERS
- ROEBLING
- WIRE ROPE CORP.
- MacWHYTE
- ROCHESTER ROPES
- LESCHEN
- HACKENSACK
- AMERICAN STEEL & WIRE
- AMERICAN CHAIN & CABLE

Size	Price
Aircraft Quality	
1/16" - 7 x 7	.0125 Ft.
1/16" - 1 x 19	.006 Ft.
5/64" - 1 x 19	.006 Ft.
3/32" - 7 x 7	.0125 Ft.
5/32" - 7 x 7	.02 Ft.
3/16" - 7 x 19	.035 Ft.
7/32" - 7 x 7	.025 Ft.
1/4" - 7 x 19	.05 Ft.
COMMERCIAL QUALITY	
.240 appr. 1/4" 6 wire	.01 Ft.
1/16" - 1 x 7 Seizing	.002 Ft.
1/16" - 6 x 7 Sash	.006 Ft.

PRICES QUOTED HEREIN ARE
60% to 80% LESS
THAN CURRENT NET MARKET

IMMEDIATE DELIVERY
FROM OUR WAREHOUSE

- *All Cable New & Prime*
- *Improved Plow Steel*
- *On Full Manufacturer's Reels*
- *All Transactions Guaranteed*

CALL, WRITE OR WIRE
FOR MORE DETAILS OR SAMPLES
Sugarman Equipment Co.
INDUSTRIAL MATERIALS DIVISION
Telephone TRinity 3225
420 EAST 8th STREET
LOS ANGELES 14, CALIF.

RAILS
NEW AND RELAYING
Track Accessories
- Prompt Shipments
- Fabricating Facilities
- Trackage Specialists

From 5 Warehouses

L. B. FOSTER CO.
NEW YORK CHICAGO HOUSTON
PITTSBURGH SAN FRANCISCO

ADDRESS THE FOSTER OFFICE NEAREST YOU!

New **RAILS** Relaying
We carry frogs, switches, spikes and bolts in stock and most all sections of rails and track accessories.
M. K. FRANK
480 Lexington Ave., New York, N. Y.
Park Building, Pittsburgh, Pa.

FOR SALE
100 HP. DIESEL ENGINE

Venn-Severin Type D—Model M—Belt Drive—33" pulley—2 cylinder 12¼ x 13½". New in 1942—excellent condition.

BURNHAM CORPORATION
Mr. C. N. Durrie
ELIZABETH, NEW JERSEY

CRANES & LOCOMOTIVES

30 ton Browning 3-G locomotive crane. New 1942. 60 ft. boom. Like new.

25 ton Gen. Elec., diesel electric locomotives 150 HP Cummins. New 1941.

65 ton Whitcomb diesel Electric locomotive. New 1944. Overhauled.

80 ton Lima 6 wheel steam switcher. New 1944.

MISSISSIPPI VALLEY EQUIPMENT CO.
501 Locust St. St. Louis 1, Mo.

EVERYTHING FOR THE TRACK FROM
SWITCH TO BUMPER

R. R. TIE PLATES
Excellent Relay
100,000 6½" x 9½" for use with 70# to 80# Rails
50,000 7½" x 10½" for use with 85# to 115# Rails

MORRISON RAILWAY SUPPLY CORP.
RAND BLDG. BUFFALO 3, N. Y.
EMPIRE BLDG. BIRMINGHAM 3, ALA.

FOR SALE
FREIGHT CAR REPAIR PARTS
RELAYING RAILS
STEEL STORAGE TANKS
THE PURDY COMPANY
122 So. Michigan Avenue
Chicago 3, Illinois

LOCOMOTIVES
80 TON WHITCOMB DIESEL ELEC. LOCO.
65 TON G.E. DIESEL ELEC. LOCO.
45 TON PLYMOUTH DIESEL LOCO.
1—16 & 1—25 TON VULCAN GAS LOCOS.
R. C. STANHOPE
60 E. 42nd St., N. Y. 17, N. Y.

RELAYING RAIL
TRACK ACCESSORIES
MIDWEST STEEL CORP.
Gen'l Off. CHARLESTON 21, W. VA.
Warehouses
CHARLESTON, W. VA.
KNOXVILLE, TENN. • PORTSMOUTH, VA.

RAILS
NEW AND RELAYING
TRACK MATERIALS AND ACCESSORIES
CARRIED IN STOCK
SWITCH MATERIAL • SPIKES & BOLTS
TRACK TOOLS • TIES • TIE PLATES
BUMPERS • COMPLETE SIDE TRACKS
BUILDERS STEEL SUPPLY CO.
4201 WYOMING AVE. DEARBORN, MICH.

RAILS
NEW AND RELAYING
Also—Track Accessories
BOUGHT — SOLD
Send us your Inquiries and your offerings
STANDARD IRON & STEEL CO.
Knoxville, Tenn. Phones—4-2559
P. O. Box 468—Western Union WuX 4-3605

THE BEST
IN
USED EQUIPMENT
HITS THE
CLEARING HOUSE

SELL YOURS THE EASY WAY
THROUGH AN AD
IN THE
IRON AGE

THE CLEARING HOUSE

RAILROAD EQUIPMENT—*FOR SALE*

STANDARD GAUGE

LOCOMOTIVES

2—12-Ton, 0-4-0, Gasoline, Plymouth
1—45-Ton, 0-4-0, G.E., Diesel-Electric, 300 HP
1—83-Ton, 2-6-2, Steam, Oil-Fired Saddle Tank
1—44-Ton, 0-4-4-0, G.E., Diesel-Electric, General Electric, 360 HP. ICC Condition
1—42-Ton, 0-4-0, Coal-Fired, Steam, With Separate Tender. A BARGAIN!

also

1—6-Ton, 0-4-0, Whitcomb, Diesel-Mechanical, 36" Gauge, New 1942
1—8-Ton, 0-4-0, Whitcomb, Gasoline, 36" Gauge

CARS

1—Well Car, 70-Ton, 40'4"
50—Gondola, All-Steel, 50-Ton, 38'2"
9—Gondola, 50-Ton, All-Steel, 40'6"
3—Gondola, All-Steel, 50-Ton, 40'3"
10—Flat Cars, 70-Ton, 41'6"
10—Flat Cars, 50-Ton, 41'6"
8—Flat Cars, 40-Ton, 60-Ft., S/U
1—Flat Car, 50-Ton, 43-Ft., S/U

4—Flat Cars, 50-Ton, 58-Ft., S/U
25—Dump, 20-Yd. Automatic Air, Lift Door
4—Dump, 30-Yd. Automatic Air, Lift Door
1—Dump, 16-Yd. Automatic Air, Lift Door
14—Passenger Cars, 64'6", All-Steel
30—Hopper, Twin, All-Steel, 50-Ton
50—Ore Hopper, All-Steel, 50-Ton
50—Covered Concentrate Hopper Cars, 1021 Cu. Ft. Capacity, 50-Ton

4—Box, 40-Ton, 40', Single Sheathed
24—Box, 40-Ton, 40', Double Sheathed
8—Box, 50-Ton, 50', All-Steel
6—Caboose, 8 Wheeled, S/U
3—Tank, 10000-Gallon, Class III
1—Tank, 3665-Gallon, Class II
5—Tank, 8000-Gallon, Class II & III

Repair Parts
For
All Types of
Freight Cars

SEND US YOUR INQUIRIES

IRON & STEEL PRODUCTS, INC.
Founded 1930
13496 S. Brainard Ave., Chicago 33, Illinois
"ANYTHING containing IRON or STEEL"
Phone: BAyport 1-3456

6,000 Gallon
8,000 Gallon
10,000 Gallon
STORAGE TANKS

Try the
WANTED
SECTION
for
"HARD-TO-FIND"
MATERIALS OR
EQUIPMENT

CARS

10—50 ton steel u/f Flat Cars
50—40 ton steel u/f Box Cars
25—40 ton 36' steel u/f Stock Cars
25—50 ton all steel drop door Gondolas
10—50 ton all steel Hopper Cars

LOCOMOTIVES

2—80 ton Lima switchers—steam
50 ton Porter switchers—steam
44 ton Davenport Diesel electric
70 ton Porter Fireless

RAILS

Complete stocks of various weights with angle bars, bolts, spikes, etc.

HYMAN-MICHAELS CO.
122 S. Michigan Ave. Chicago 3, Ill.

SALE or RENT

1—10-ton Huber 3-wheel Gas Roller, Hydraulic Steer.
1—MC-4 Lorain Moto Truck Crane. 1944.
1—205 Koehring Gas Shovel.
1—505 Koehring Diesel Dragline. 1942.
1—82 Lorain Diesel Combination Shovel and Crane. 1942.
1—P & H 855 Shovel, 2 yd. D-17000 Engine. 1946.
1—35-ton Vulcan Std. Ga. Diesel Locomotive. New 1938.
1—45-ton General Electric Diesel Electric Locomotive. 1940.
1—80-ton American 0-6-0 Saddle Tank Locomotive.
1—22½-ton Industrial Locomotive Crane. National Board Boiler. Rebuilt.
1—35-ton American Diesel operaten Locomotive Crane. 1947.

B. M. WEISS COMPANY
Girard Trust Co. Building Philadelphia 2, Pa.
Rittenhouse 6-2311

BUSINESS OPPORTUNITIES

WANTED

WANTED

STEEL TUBING
AND PIPE

Give full particulars
including price.

WALLACK BROTHERS
7400 So. Damen Ave., Chicago 36, Ill.
GROVEHILL 7474

NAILS WANTED CARLOADS

2d, 3d, 4d, 5d, 6, 7d, 8d, 9d, 10d, 12d, 16d, 20d—Box, Common, Finish, Casing, Cement Coated, Nails, All Types and Sizes at low prices. F.O.B. MILL.
Also: Galv. Shingle, 3 T F.H.A. 14 gauge Box about ¼" hd. Galv. Roofing ¾"—⅞"—1"—1¼"—1½"—2"—(11) gauge—(7/16 head).

WANTED

Galv. Sheets Bright Flat — Hot Rolled Sheets — Cold Rolled Sheets — Standard Sizes — Carload Lots — Will Pay Highest Prices. F.O.B. Mill — Write

20TH CENTURY HARDWARE COMPANY
1019 North La Cienega Boulevard
West Hollywood, Los Angeles 46, Calif.
Telephone—Crestview 5-4013

—WANTED—

EXPORT DISTRIBUTORSHIPS
and ADDITIONAL SUPPLIERS

by

Kurt Orban Company, Inc.
21 West St., New York 6, N. Y.

We specialize in EXPORTING BASIC IRON & STEEL and related products

---

WE BUY STEEL

ALL WIDTHS — TEMPERS — GAUGES
COILS OR LENGTHS

SEABOARD STEEL COMPANY, INC.
New Haven, Conn.

Air Compressors Wanted

Horizontal Water Cooled—100 CFM or larger; also
Gasoline or Diesel Driven Portable Machines

L. W. BAUER
North Bergen, N. J.

WEISS STEEL CO. INC.
600 WEST JACKSON BLVD.
CHICAGO 6, ILLINOIS
Buyers of Surplus Steel Inventories
30 Years of Steel Service

WANTED

HOT ROLLED STRIP STEEL

3/16" x 7" 3/16" x 5½" 7/32" x 7⅜"
¼" x 7" ¼" x 8¼"

Any quantity—low carbon—deep drawing quality

KEY COMPANY
P. O. Box 494, East St. Louis, Illinois

FOR SALE

Operating Foundry, Birmingham area, medium sized progressive industrial city. Within corporate and switching limits. Excellent two rail and trucking connections. Ingalls built and erected modern fire proof building 100 x 260 feet, concrete floors. Space to triple present production. No. 5 Whiting Cupola American Centrifugal Blower. Sly Tumbling Mills American Sandcutter. Motorized throughout. Natural Gas Ovens, favorable rates. Aluminum Match Plate Patterns. Assured pig iron and coke supply for 1500 or more tons present capacity.

No labor or financial trouble. Excellent labor with young experienced personnel now working. Number one location for extensive plant in any mechanical group. Aged principal shareholder seeking retirement. Priced at $150,000 complete. Prompt investigation will obtain bargain for purchaser seeking increased production or division of present facilities. [illegible] photos. Direct dealings only.

ADDRESS BOX F-824
Care *The Iron Age*, 100 E. 42nd St., New York 17

EMPLOYMENT EXCHANGE

EMPLOYMENT SERVICE

SALARIED POSITIONS $3,500-$35,000. If you are considering a new connection communicate with the undersigned. We offer the original personal employment service (39 years recognized standing and reputation). The procedure, of highest ethical standards, is individualized to your personal requirements and develops overtures without initiative on your part. Your identity covered and present position protected. Send only name and address for details. R. W. BIXBY, INC., 274 Dun Bldg., Buffalo 2, N. Y.

HIGH GRADE MEN—Salaries $3,000 to $25,000. Since 1915 thousands of Manufacturing Executives, Engineers, Sales Managers, Comptrollers, Accountants and other men of equal calibre have used successfully our confidential service in presenting their qualifications to employers. We handle all negotiations. Submit record with inquiry. The National Business Bourse, 20 W. Jackson Blvd., Chicago.

REPRESENTATIVES WANTED

POWDERED METAL PARTS FABRICATOR DESIRES ESTABLISHED MFG.'S AGENT WITH ALLIED LINES FOR EASTERN AND MID WEST TERRITORIES. ADDRESS BOX F-796, CARE *THE IRON AGE*, 100 E. 42nd ST., NEW YORK 17.

ESTABLISHED manufacturers' agents for patented mechanical jack that lays underground pipe with absolute precision without digging ditch, disturbing pavement or floor. Substantial market with oil companies, utilities, waterworks, municipals, railroads, mines, industrials, plumbers, electricians. Rugged. Foolproof. Cheaper and superior to hydraulic outfits. Shipments now. J. A. POSTELL, 936 W. Peachtree St., N.W., Atlanta 3, Ga.

SITUATIONS WANTED

Supt. or above of Steel & Alloy Fabrication. 25 years' experience. Oil refinery, Chemical industry, pipe lines, boilers from locomotive to miniature, heat exchangers, stacks, etc. Welding, hand, union melt, Lincoln Automatic & semi codes. A.P.I., A.S.M.E., A.B.S., & U.S.C.G. Gauges to 2" thick, pounds to 100 tons. Design own dies, jigs, & fixtures. Know budget, scheduling, labor relations, time study, incentives and training of Foreman & mechanics. Maintenance and operations of all machines & equipment. Available after January 1st. Location immaterial. Salary and percentage of profits. Address Box F-823, care *The Iron Age*, 100 E. 42nd St., New York 17.

WORKS MANAGER—MANAGER OF INDUSTRIAL RELATIONS. Excellent record in management. Experienced in melting, steel castings, forging, rolling, machining stamping; supervision of personnel work, foreman training, incentive plans, time study and production engineering. Address Box F-754, care *The Iron Age*, 100 E. 42nd St., New York 17.

MANUFACTURING EXECUTIVE—Eighteen years well rounded experience. Industrial engineering background. Age 39. Now in Chicago, prefer smaller community. Full information to responsible parties. Address Box F-815, care *The Iron Age*, 100 E. 42nd St., New York 17.

WORKS MANAGER—M. E. background, experience in heavy precision machinery, assembly, structural steel fabrication and metal coatings. Desires position with small company. Salary $7500. Address Box F-813, care *The Iron Age*, 100 E. 42nd St., New York 17.

MACHINE SHOP SUPERINTENDENT. Twenty years experience, first class mechanic and knows how to get results. Address Box F-812, care *The Iron Age*, 100 E. 42nd St., New York 17.

DROP FORGING SALES MANAGER, twenty-five years' experience sales and production. Wide acquaintance with buyers middle west. Proven ability. Available January first. Address Box F-825, care *The Iron Age*, 100 E. 42nd St., New York 17.

HELP WANTED

HELP WANTED

FACTORY MANAGER

MECHANICAL SPRING EXPERIENCE

SALARY $12,000

Medium size spring company in business over 25 years, wants a top notch man thoroughly familiar with Torrington and Sleeper & Hartley Coilers; also wire forming machines in general. Must have sound business judgment, ability to handle Factory and Engineering operations, with complete responsibility. Factory located in New York. All replies held strictly confidential. Please give complete information as to background.

ADDRESS BOX F-792
Care *The Iron Age*, 100 E. 42nd St., New York 17

Rates for Employment Service, Help, Representatives, Accounts and Situation Wanted Ads

To insure insertion copy should be in our hands
10 days in advance of issue.

Employment Service Rates
Help Wanted Rates

Representatives Wanted Rates
Accounts Wanted Rates

COUNT SEVEN WORDS FOR KEYED ADDRESS

Set solid—50 words or less	$ 8.00
Each additional word	16c
All capitals—50 words or less	$10.00
Each additional word	20c
All capitals, leaded—50 words or less	$12.00
Each additional word	24c

Situation Wanted Rates

Situation Wanted Ads
Payable in Advance

Set solid—25 words or less	$2.00
Each additional word	8c
All capitals—25 words or less	$3.00
Each additional word	12c
All capitals, leaded—25 words or less	$4.00
Each additional word	16c

Display Advertising Rates Given on Request

DO NOT SEND cash through the mail. Use money order or check.
DO NOT SEND ORIGINAL letters of recommendation in reply to advertisements—Copies will serve the purpose. Replies forwarded without charge.

ADVERTISERS IN THIS ISSUE

A

Aaron Machinery Co., Inc. 140, 143
Acheson Colloids Corp. 94
Acorn Iron & Supply Co. 148
Advance Paint Co. 18
Albert & Davidson Pipe Corp. 148
Aluminum Co. of America (Fastner Div.) 133
American Air Compressor Corp. 147
American Brass Co., The 11, 12
American Petrometal Corp. 136
American Wheelabrator & Equipment Corp. 75
Anderson, A. E. Construction Corp. 133
Armel, James P. 147
Armstrong-Blum Manufacturing Co. 117
Atlantic Steel Products Co. 134

B

Baird Machine Co., The 33
Barium Steel & Forge, Inc. 10
Baron Steel Company 148
Bauer, L. W. 151
Belmont Iron Works 134
Belyea Co., Inc. 146
Bennett Machinery Co. 145
Bethlehem Steel Co. 3
Bixby, R. W., Inc. 152
Blaw-Knox Co. 143
Boiardi Steel Corporation 135
Bolling, Stewart & Co., Inc. 149
Bradley, C. C. & Son, Inc. 132
Browning Crane & Shovel Co., The 131
Builders Steel Supply Co. 150
Burnham Corp. 150

C

Carborundum Co., Abrasive Div. 16
Carpenter Steel Co., The 14
Cattie, Joseph P. & Bros. 135
Chicago Perforating Co. 135
Cincinnati Planer Co., The 24
Cincinnati Shaper Co., The 4
Cleveland Steel Tool Co., The 136
Climax Molybdenum Co. 28
Consolidated Ry. Equipment Co. 148
Continental Salvage & Machinery Corp. 140
Cowles Tool Co. 132
Crawford, F. H. & Co., Inc. 144

D

Denison Engineering Co., The 85
Diamond Manufacturing Co. 132
Dictaphone Corp. 149
Donahue Steel Products Co., Inc. 144
Dony, D. E. Machinery Co. 140
Dreifus, Charles, Co. 149
Dreis & Krump Mfg. Co. 134
Dulien Steel Products, Inc. 148
Duquesne Electric & Mfg. Co. 146

E

Eastern Machine Screw Corp., The 134
Eastern Machinery Co., The 138
Eastern Tool & Mfg. Co. 135
Electric Equipment Co. 146
Electric Storage Battery Co., The 39
Elyria Belting & Machinery Co., The 140
Emerman Machinery Corp. 141
Erie Foundry Co. 17
Espen-Lucas Machine Works, The 136
Eutectic Welding Alloys Corp. 132
Ex-Cell-O Corp. 40

F

Fabricant Steel Products, Inc. 148
Federal Machine & Welder Co. 37
Fellows Gear Shaper Co., The 132
Ferry Cap & Set Screw Co., The 23
Ford Chain Block Div., American Chain & Cable Co., Inc. 38
Foster, L. B., Co. 150
Frank, M. K. 150
Frasee, Peter A. & Co., Inc. 87
Furnace Engineers, Inc. 133

G

Galbreath Machinery Co. 140
Gavenda Bros., Inc. 147
General Electric Co., Apparatus Dept. 21, 22, 109, 110, 115
Glazer Steel Corp. 149
Goodman Electric Machinery Co. 147
Goss & DeLeeuw Machine Co. 136
Greenpoint Iron & Pipe Co., Inc. 148
Griffin Manufacturing Co. 136
Gulf Oil Corp. 29
Gulf Refining Co. 29

H

H and P Die & Stamping Co., The 134
Hahn & Brandt Machinery Co. 146
Hardinge Bros., Inc. Front Cover
Harnischfeger Corp. 132
Harrison Mchry. Exchange, Inc. 140, 141, 145, 147
Hartford Steel Ball Co. 132
Hawkins & Co. 147
Hayward Company, The 134
Hendrick Manufacturing Co. 111
Hill-Clarke Machinery Co. 142
Hubbard, M. D. Spring Co. 131
Hy-Alloy Steels Co. 110
Hyman, Joseph & Sons 146
Hyman-Michaels Co. 151

I

Illinois Clay Products Co. 34
Inland Steel Co. 44
Interport Commercial Corp. 149
Iron & Steel Products, Inc. 149, 151

J

Jones & Laughlin Steel Corp. 20

K

Kester Solder Co. 132
Key Company 151
King, Andrew Co., The 136
Knox, Earle E., Co. 146
Krasilovsky, Mike, Inc. 144

L

Lafayette Steel Co. 147
Land, L. J., Inc. 142, 146
Landis Machine Co. 114
Lang Machinery Co. 144
Leland-Gifford Co. 136
Leschen, A. & Sons Rope Co. 112
Linde Air Products Company, The 6, 7
Lobdell Company 133

ADVERTISERS IN THIS ISSUE

Long Island Beam Co. 149
Luria Bros. & Co., Inc 123

M

McDaniel Refractory Porcelain Co. 111
MacCabe, T. B., Co. 147
Machinery Liquidating Co. 141
Malco Machinery Co. 143
Mesta Machine Co. 73
Michiana Products Corp. 136
Michigan Fdry. Supply Co. 147
Micromatic Hone Corp. 36
Midwest Steel Corp. 150
Miles Machinery Co. 144
Mississippi Valley Equipment Co. 150
Monarch Steel Co. 149
Morey Machinery Co., The 139
Morrison Railway Supply Co. 150
Mundt, Chas. & Sons 135

N

National Business Bourse, The 152
National Machinery Exchange, Inc. 146
National Steel Corp. 31
New Britain-Gridley Machine Div.
  New Britain Machine Co., The .... Inside Back Cover
New Britain Machine Co., The .... Inside Back Cover
Newark Gear Cutting Machine Co. 134
Nicholson, W. H. & Co. 136
Nilson, A. H., Machine Co. 136

O

O'Brien Machinery Co., The 144
O'Connell Machinery Co. 140
Ohio Locomotive Crane Co., The 134
Ohio Seamless Tube Co., The 15
Orban, Kurt Co., Inc. 148, 151
Ornitz Equipment Corp. 146
Ottemiller, Wm. H., Co. 135
Ozalid Division of General Aniline and Film Corp. 83

P

Payne, N. B. & Co., Inc. 147
Peninsular Grinding Wheel Co., The 8, 9
Pennsylvania Iron & Steel Co. 136
Peoria Malleable Castings Co. 134
Pittsburgh Gear Co. 131
Platt Bros. & Co., The 132
Potter & Johnston Co. 13
Purdy Co., The 150

Q

Quality Forgings, Inc. 141

R

Reading Chain & Block Corp. 115
Republic Steel Corp. 25
Ritterbush & Co., Inc. 137
Ryerson, Jos. T. & Son, Inc. 42

S

Seaboard Steel Co. 151
Shore Instrument & Manufacturing Co., The 134
Simmons Machine Tool Corp. 143
Southern Galvanizing Co. 132
Standard Iron & Steel Co. 150
Standard Lime and Stone Co., The 149
Stanhope, R. C., Inc. 150
Stanley Works, The 132
Steel Processing Corp. 143
Steel & Tubes Div., Republic Steel Corp. 25
Steel & Tube Div., Timken Roller Bearing Co. .... Back Cover
Sterling Bolt Co. 35
Sugarman Equipment Co. 150
Sun Oil Co. 79
Sunbeam Stewart Industrial Furnace Div. of Sunbeam Corp. 81
Superior Steel Corp. 113

T

Texas Company, The 5
Thomas Flexible Coupling Co. 30
Thomas Machine Manufacturing Co. 112
Timken Roller Bearing Co., Steel & Tube Div. .... Back Cover
Tinnerman Products, Inc. 77
Topflight Tape Co. 148
Torrington Co., The 134
Tractor & Equipment Co. 147
Twentieth Century Hwde. Co. 151

U

Union Carbide & Carbon Corp. 6, 7
United Engineering & Foundry Co. 19
United States Steel Corp. 120
United States Steel Supply Co. 120
Universal Mchry. & Equipment Co. 145

V

V & O Press Co. 134
Victor Machinery Exchange, Inc. 145

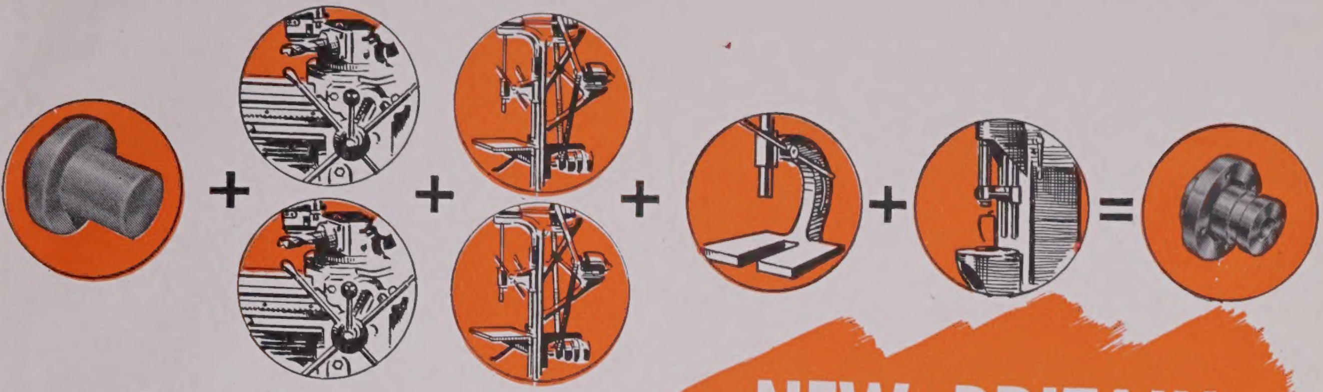
W

Wallack Bros. 151
Warner & Swasey Co. 32
Waterbury Farrel Foundry & Machine Co. 91
Webb Wire Works, The 135
Weirton Steel Co. 31
Weiss, B. M., Co. 151
Weiss Steel Co., Inc. 151
Wetherell Bros. Co. 135
Whiting Corporation .. Inside Front Cover
Wigglesworth Mchry. Co. 144
Williams, J. H. & Co. 135
Winston Mchry. Co., Inc. 145
Worcester Stamped Metal Co. 132

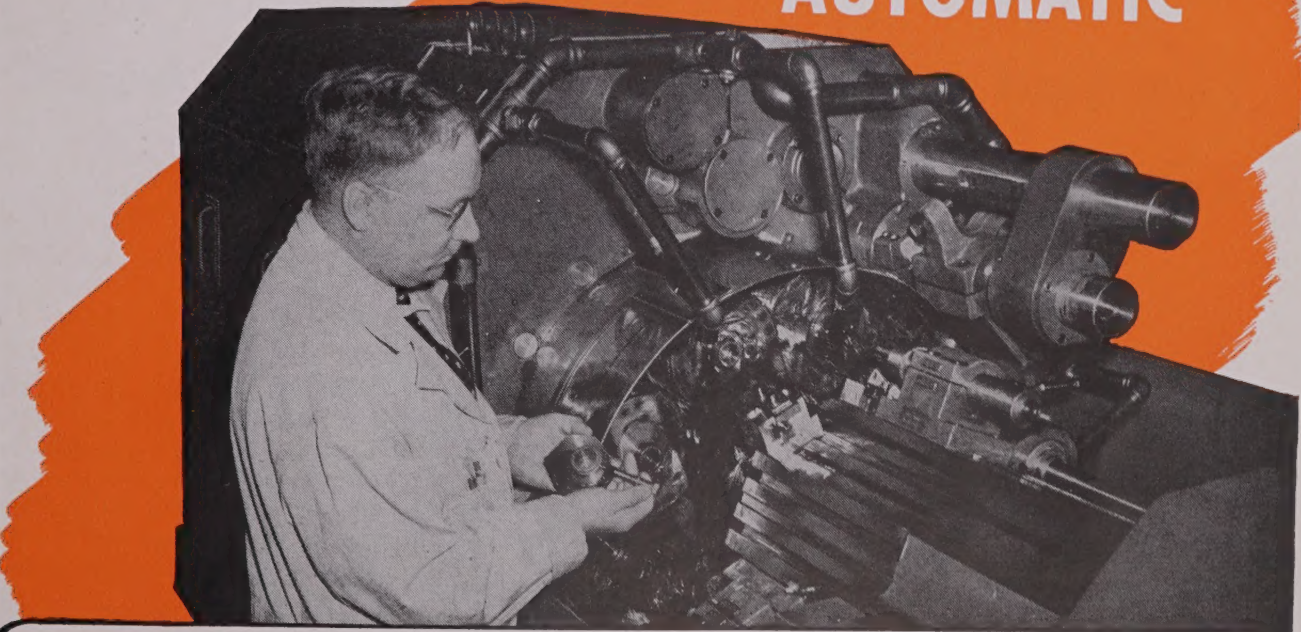
CLASSIFIED SECTION

Business Opportunities 151
Clearing House 137, 151
Employment Exchange 152
Sub-Contracting Parts and Sub-Assemblies Made to Order 199-202
SEE FIRST AND THIRD ISSUES
Wanted 151

If you are doing this . . .



put the whole job on a.. NEW BRITAIN AUTOMATIC

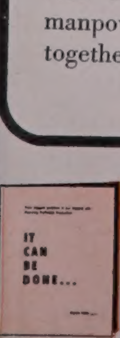


In many plants, this sort of operation has been going on for years . . . on the theory that the run was too short for an automatic . . . or because "It couldn't be done economically on an automatic."

The squeeze between manufacturing costs and selling prices has prompted many a company to take a considered "second look" at such operations. As a result, a wide variety of pieces are now being completely machined on New Britain automatics, with important economies in manpower, machines, floor space and cost per piece . . . together with improved quality of work.

These features help cut cost per piece on NEW BRITAIN CHUCKERS

- *Double Indexing* of spindle carrier with loading in two positions can be provided to complete both ends of a piece on a single machine.
- *Spindles May Be Stopped* to permit accurate alignment of part for many secondary operations.
- *Open End Construction* reduces setup time and makes tool adjustment easy.
- *Variable Chucking Pressures* in last positions prevent distortion of thin-walled or fragile pieces.



IT CAN BE DONE...

The piece sketched illustrates many typical second operations which New Britains can eliminate. Get the facts and figures on actual jobs. Send for the free folio "Cost Histories". It may suggest a solution to multiple operations which are bottlenecking your production.

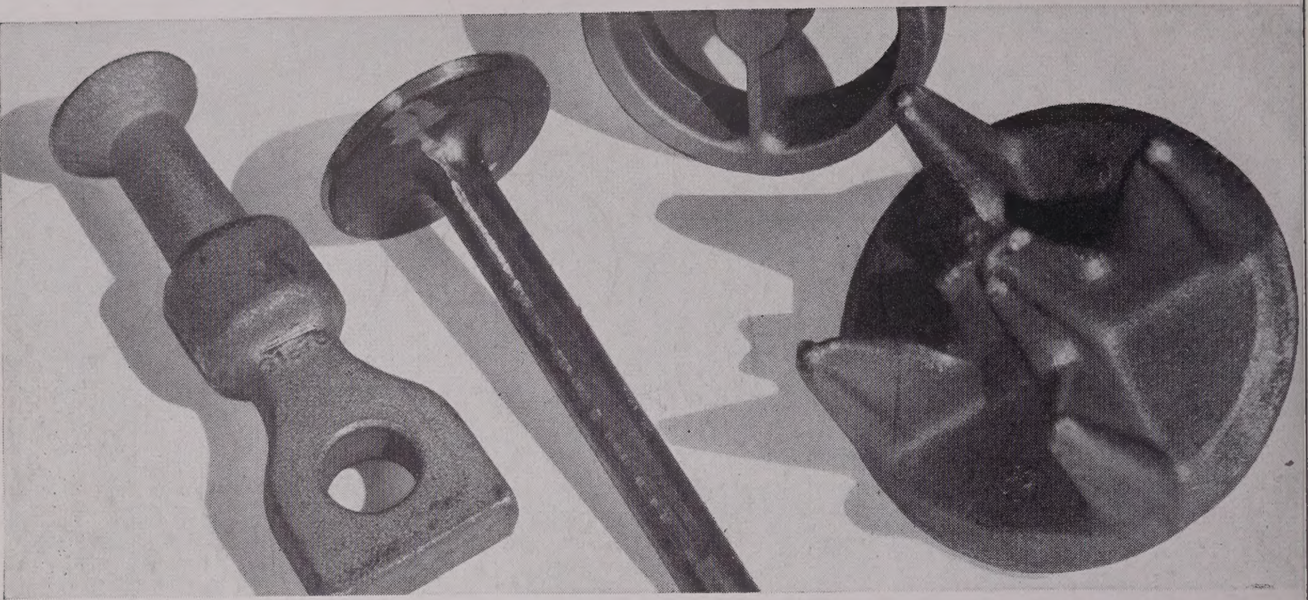
THE NEW BRITAIN MACHINE CO.

NB

NEW BRITAIN

Automatics

THE NEW BRITAIN MACHINE COMPANY
NEW BRITAIN-GRIDLEY MACHINE DIVISION
NEW BRITAIN, CONNECTICUT



Timken® stainless steel forging bars give you: 1. UNIFORM FORGEABILITY 2. UNIFORM MACHINABILITY

FROM bar to bar and from heat to heat, you can depend on the uniformly high quality of Timken stainless steel forging bars.

Since the physical and chemical properties of each analysis are always the same, Timken stainless steel gives you uniform, top-quality forgings every time. Careful surface conditioning of forging bars and billets reduces scrap losses and lowers forging costs.

And every one of your Timken stainless steel forgings machines the same way—fast, easily, with a good surface.

As a result of this uniform forgeability and machinability, you have fewer rejects, less scrap loss, and unvarying high quality in your finished product.

Timken stainless steel forging stock owes its un form high quality to: 1. Specialized skill of Timke metallurgists, developed through years of experienc in the production of fine alloy steels. 2. Precise qualit control from melting to final inspection. 3. The Tim ken Company's long-time leadership in alloy ste research. 4. Special practices which are practical onl in a large, flexible specialty mill.

The Timken Technical Staff is ready to help yo select the precisely correct analysis to meet your re quirements. Call on their services at any time. Th Timken Roller Bearing Company, Steel and Tube Div sion, Canton 6, Ohio. Cable address, "TIMROSCO'

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

TIMKEN
TRADE-MARK REG U.S. PAT. OFF.
Fine Alloy
STEEL
and Seamless Tubes

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.